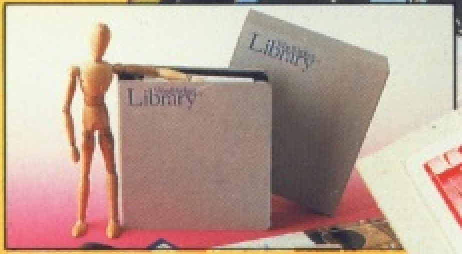
Volume 1
Number 12
May 1989
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A Database Publication

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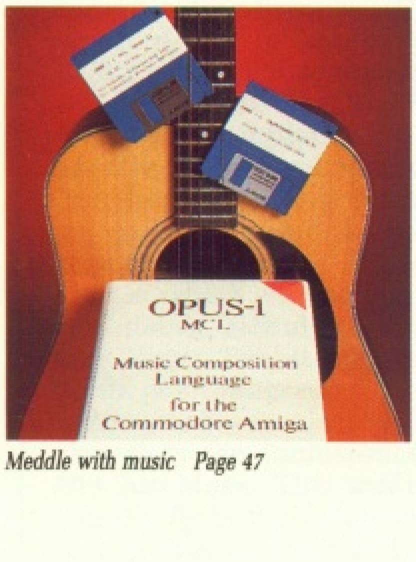
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BASIC SERIES



PROGRAMMING



Meddle with music Page 47

PRODUCTIVITY

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GAMES REVIEWS



Zany Golf

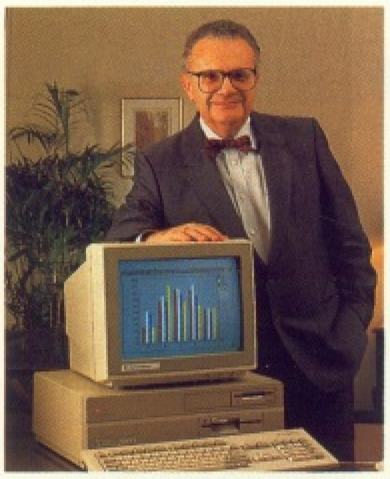


Cosmic Pirate

Plus

The very best reviews of beezer games.

- Populous solves ommipotence problems.
- Prospector is out of the Xordinary.
- Afterburner takes to the skies.
- Hostages doesn't hang around.
- Cosmic Pirate plunders an Excellent 92%.
- Captain Fizz gives the Blasterons what's coming to them.
- Zany Golf proves greens are good for you as the top game.
- Denaris breathes new life into the shoot'em up.
- The desolation of Prison gets depressing.
- Chase proves some software is too expensive even at £10.
- All this, and more, starting on Page 68.



Dr Rubin, a popular promotion

Commodore regroups

HAVING grown accustomed to renewed profitability, Commodore is restructuring its chain of command. We reported the appointment of Medhi Ali from Pepsi last month.

He has been joined on the Board of Directors by Dr Henri Rubin who has headed up Commodore research and development for several years. This is part of the renewed vigour with which the company is attacking both development and marketing.

Europe used to be treated as a whole, with all 12 divisions reporting to Germany, but they will be restructured into groups of three or four countries which then report to Medhi Ali. It looks as though the UK will not fit into a European group and so the boss of Commodore UK, Steve Franklin, will report direct to Medhi at West Chester, Philadelphia.

Marketing in the UK has seen an emphasis on bundles, with a number of distributors putting packs together. Commodore has now announced the official bundle, which will include a modulator, Nebulus, Star-Ray, Roger Rabbit and the Spritz paint program.

What makes the deal really special is the inclusion of 500 Air Miles. This means you can fly to Paris, Amsterdam or Brussels for free. The A500 bundle costs £499, but you will still be able to get A500s without the gubbins for £399.

More power to your Amiga

POWER Computing is to release a range of Amiga upgrades for everyone from the impecunious A500 owner to the richest A2000 tycoon. The cheapest device is an add-on 3.5in floppy drive which uses a multi-purpose printed circuit board. It will work with a number of drive mechanisms, so even when your drive wears out you won't have to junk the whole unit.

The company has more exciting, and expensive, add-ons which live up to the company name – modified versions of the Great Valley Products hard drives.

GVP has a great reputation in America for building high quality Amiga drives, ranging from a 20 meg unit for the A500 at £499 to a 100 meg Quantum drive for the A2000 at £949.

Quantum hard discs are very fast, with an 11 millisecond access time thanks to a cache controller, They have proved very popular with professional Amiga users in the US.

All the A500 drives have special slots which can take up to 2 meg ram and autoboot roms.

GVP's newest product is a 68030 card running at 25Mhz which should be at least 10 times faster than a standard Amiga. It is only available for the A2000 and costs between £700 unpopulated without the maths co-processor and £3,000 for a board with 8 megs in simm modules.

The Power/GVP 68030 card is not tied to the Amiga bus speed which makes it very much faster than other speed-up boards.

A new program from Power Computing is Video Magic, a desktop video program aimed at people who have to give presentations. This is a big market in the US and one which is rapidly growing in the boardrooms of Britain.

The name belies the program's audio capabilities, which allow pictures to be syncronised with sound, either using colour cycling, PASE animation files or by flipping static IFF pictures.

When a presentation is complete it can be saved easily to an autoboot disc with a run-time module. The speaker can set up a script to run or trigger individual events using a remote control which is included in the price of £79.95.

For more details contact Power Computing 0234 273000.



An easy way to get mono art into the Amiga

Scanner interface

DESKTOP publishing is growing in importance on the Amiga. Gold Disk, which does the Professional Page DTP program, saw the need for a scanner so that users can get pictures into their documents and has produced an interface for the Canon IX12 scanner.

Citizen's micro drive

LOVERS of small drives will be impressed by Citizen Europe's OU disc drives. The new 3.5in units are the world's smallest measuring 19.5 x 101.6 x 130 millimetres, and weighing 320 grams. This has been made possible by a side mounted disc head and specially designed carriage. This is about two thirds of the height of most Amiga drives without the outer casing.

Colour DTP on show

NEW developments due in the shops soon include the AT bridgeboard and the A590 hard drive. The Bridgeboard is now available in the US and the A590 hard drive which has completed a pilot production run of 400 units and is in production in the Far East.

A whole bunch of new toys were put on display at the CeBIT trade show in Hanover. There was a colour DTP package consisting of an A2000 with 3 meg ram, 40 meg hard disc, a flicker fixer, ProPage, ProDraw and NEC Silentwriter LC890 Postscript compatible printer.



Coming . . . A590 hard drive

The system will produce colour separations and can scan colour pictures using a Sharp scanner and the ASDG interface. A desktop video package for the A500 which includes an RGB splitter, digitiser and genlock was described as being attractively priced.

A high resolution board with 1,024 by 1,024 by 256 colours – from a palette of 16 million – was shown. This is still in the prototype stage and will only be available for the A2000.

Commodore seems set to build on its success – Amiga software already outsells ST titles in the Gallup chart. It's looking good.

AmiEXPO art was major attraction

THE first AmiEXPO Art and Video contest was a huge success with more than 200 entrants and over 350 images and videos totalling two hours of viewing time. Entries came from Canada, the continental US and Hawaii. The entrants were of all ages and a third of submissions came from female artists. Judges came from the Amiga and computer graphics communities.

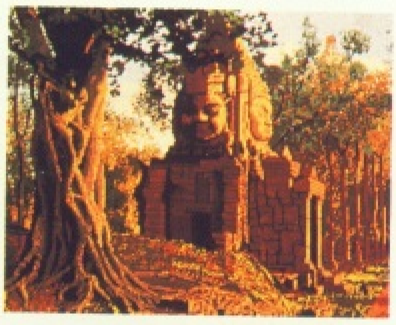


Giorgio Gomelsky won the Mixed Media award for works that combined computer generated video with live or prerecorded video with his "CIA" rock video. This has been shown on US TV. Giorgio is known as the Mad Russian and worked with a number of groups in the 1960s including the Beatles and the Rolling Stones.

He used an Amiga 1000, Amiga 2000, Live, SuperGen, Invision, Deluxe Paint II, Page Flipper Plus Effects, Digi-View, Digi-Paint, video switcher. A still shot really does not do the hard-hitting video justice.



Louis Markoya won the category for images created using three dimensional rendering and ray-tracing packages on the Amiga with Woodland2 using an Amiga 2000 with 6 megs ram, Hurricane card, and Turbo Silver. He had to borrow 3 megs for the picture. Louis is something of an Amiga celebrity. He must have spent hours defining the shapes.



Jim Schanz was the winner in the 2D category for artworks created using paint programs with Burmese Penguin Hunt. This was the only winner with a normal Amiga 500 and 1 meg. He used Deluxe Paint II. It is a sure bet he'll be first in the queue to buy a copy of Dpaint III.

Commodore ups service

CUSTOMERS who have hit problems when claiming under warranty can take heart from a new system installed at Commodore.

Using bar codes, it tracks every product through quality control and distribution, recording each stage on a database. In the event of warranty claims, Commodore can obtain test and sales history on each item.

Industrial software specialist SystemBuild (0778 344388) produced the package in three weeks. It has been installed at Commodore's distribution centre in Peterborough and at a packing depot in Gamlingay near Cambridge by QCD, the company responsible for quality control on all Commodore products sold in the UK.

Each product coming into the warehouse from Commodore's various manufacturing plants is unpacked for testing by QCD. The unique serial number marked on the product at the manufacturing stage is logged into the System Build package which then produces its set of bar codes.

As each product is checked, its progress through the system is recorded on the database.

Innovation on an Amiga can win £500

A NATIONWIDE search is being launched by Commodore UK to find the most innovative use of an Amiga in the field of hobbies.

The winner, who will collect equipment worth £500, will be named at the Commodore Show organised by Database Exhibitions and to be held from June 2 to 4 at London's Novotel in Hammersmith.

"The Amiga is recognised as the leading computer in the leisure area, but most people tend to think of leisure computing only in terms of playing games", said Dean Barratt, Commodore's UK marketing manager.

"In reality the Amiga is being used for all sorts of leisure activities from bird watchers logging their latest sightings to horse racing enthusiasts keying in data to try and pick the winners.

"We even heard of one reptile collector who keeps his pets in trim by working out their menus on the Amiga. The potential uses of the computer for leisure acivities is endless. We want to find out more about the diverse uses of the Amiga in the home".

All you need to do to enter the competition is to write a brief description of how the Amiga helps your hobby – no more than 500 words – and send it along with any support material on disc and the entry form to *Amiga Computing*.

In turn, the editor will nominate the most outstanding entry received by the publication to go forward to the grand final which will be held at the Commodore Show.

All finalists will be invited to demonstrate their innovations in a specially designed Leisureama feature area.

During the event, editors from the leading Commodore magazines will form a panel to select the winner.

ENTRY FORM

Name________________

Address________________

____

Daytime telephone________________

Send your entry to Amiga Computing, Europa House, Adlington Park, Adlington, Macclesfield, Cheshire SK10 4NP.

Amiga v ST battle at Menzies stores

THE Amiga is set to take on its main rival in a High Street battle. Its protagonist is the Atari ST, the battlefront is spread throughout Menzies stores and to the victor could go the lion's share of Menzies' sales next Christmas.

Menzies cut the number its shops stocking the ST after disappointing sales last year and for the first time has brought in the Amiga as a serious challenger to the Atari machine.

"It is a case of sussing out what the customers want", Menzies' merchandising manager Bob Shingleton told *Amiga Computing.* "The volume of Atari ST sales certainly did not come up to our expectations".

Starting from March, Menzies has cut back the number of stores stocking the ST from the Christmas figure of 45 to 20. For a trial period, it has put the Amiga into 14 stores and will be monitoring sales of both throughout spring and summer.

The aim of this exercise is to established which 16 bit hardware will be stocked in readiness for the next Christmas boom. It is thought unlikely that Menzies will opt for both machines.

Accent on presentation

THE prestigious Desktop Publishing Show organised by Database Exhibitions (0625 879970) will take on a new look this year with Presentations '89, described as a unique "show within a show", highlighting the art of professional presentation.

It will be held at the London Arena in the city's fast developing Docklands from October 4 to 6.

PIRA, the leading independent advisory service, will combine with a team of recognised authorities to run a series of seminars covering the full range of communication skills.

Database Exhibitions managing director Michael Meakin said: "The new professionals in computer graphics and the more traditionally based audio-visual specialists both have much to offer the marketplace individually, and even more to offer when they can come together in a single forum.

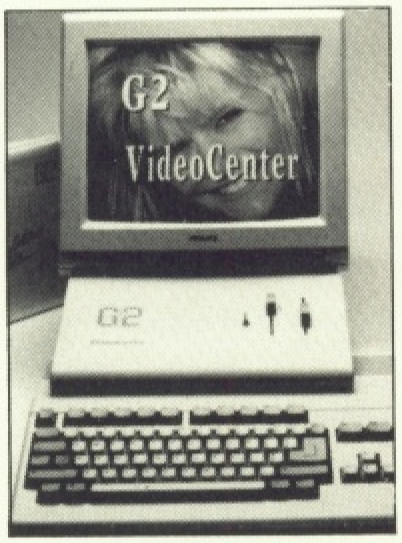
"Converging technologies is the way forward, and this is what Presentations '89 is all about".

Video via the Amiga

QUALITY video output for the Amiga has caused problems in the past but Farnham-based G2 Systems believes it has now cracked them.

G2 (0252 737151) has just launched its Amiga VideoCenter which it claims gives quality output at a reasonable price.

It combines the facilities of a video mixer, genlock and PAL encoder, mixing incoming video signals with computer output either using sliding faders or under software control. G2 has not finalised pricing but promised it would be under £600.





PageStream joins the DTP battle

JIM BUTTERFIELD reporting from Canada

DESKTOP publishing systems and PostScript interfaces are proliferating. PostScript is a proprietary system that allows text and drawings to be rendered to almost any level of detail. Using PostScript languages, a draft copy might be generated on a suitably-equipped laser printer, followed by final output to a compatible typesetter.

Traditionally, the logic – and lots of supporting memory – has been built into the printer or typesetting device. This can be costly.

New systems put the logic into the Amiga. This allows for PostScript drafts output to much less expensive printers, but calls for a good deal of ram within the computer.

Professional Page, a desktop publishing system by Gold Disk, started as a PostScript device only, but has been upgraded to allow output to dot matrix printers. Its output is essentially a screen pixel dump.

PrintScript is a PostScript interpreter now shipping. This program acts as a PostScript print driver and is usable with a variety of desktop publishing programs that think they are working directly with a PostScript printer.

PageStream is a desktop publishing system. It was formerly announced as Publishing Partner, but the software house apparently decided that there were too many PP names in the Amiga market.

PageStream is long-awaited, partly because SoftLogic advertised it for almost a year before recently starting to ship.

The print quality of this package is widely praised, but the initial release is reported to have a number of operating anomalies – bugs, or perhaps complex usage rules.

Users on many networks are grouching because the Amiga doesn't get the amount of attention in the press that they feel it deserves. There is talk of campaigns to give the Amiga more visibility, especially in business applications.

On one board employees of a Wall Street public relation firm are outlining methods to approach the media for better "Amiga consciousness".

The Lattice C Compiler, version 5.0, has been slated for an upgrade for some time to fix problems on the initial release. After a number of production delays, the upgrade disc – identified as 5.02 – has been shipped to all registered users.

The upgrade contains extensive replacement files and patches for the five-disc Lattice C system. You need only trigger the script file and all upgrades will take place automatically, with requesters calling for insertion of the proper discs as needed.

The modifications are extensive and the upgrade activity runs for about an hour on a floppy disc system. Users with a hard disc will see the time reduced to 15 minutes.

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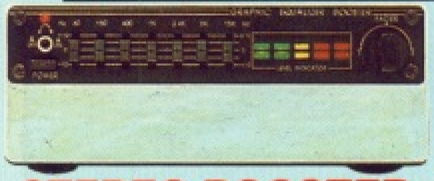
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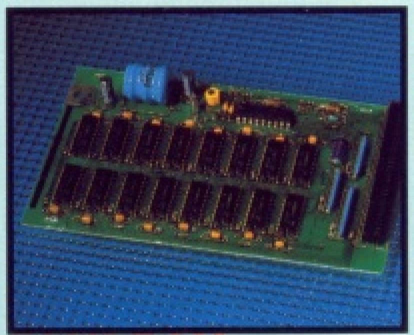


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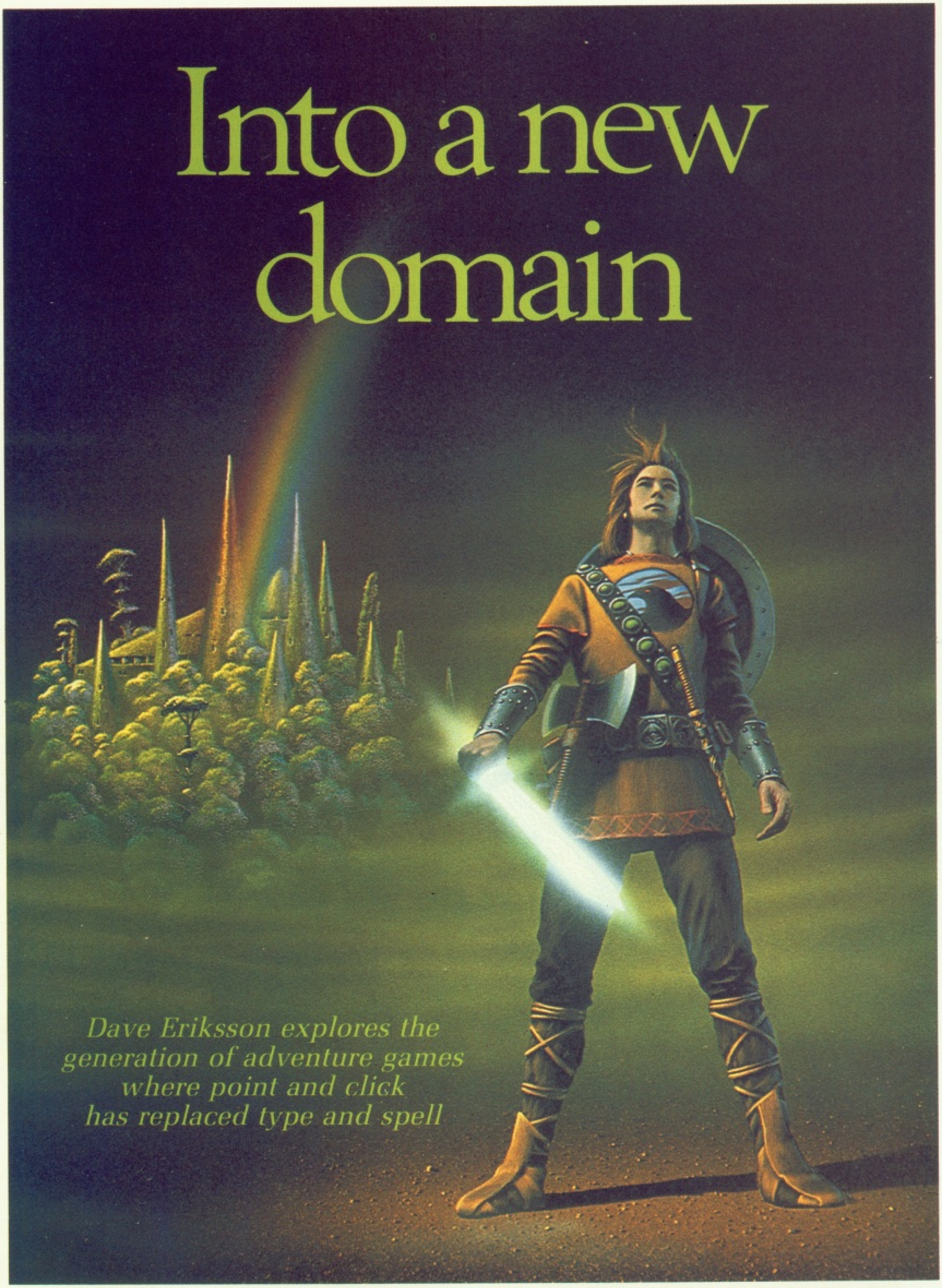
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Into a new domain

Dave Eriksson explores the generation of adventure games where point and click has replaced type and spell

ADVENTURES are changing. Once there were only text games, anything graphic was all in the mind. Then we had what we glibly called graphic adventures, similar types of games but with some pretty crude pictures that, if anything, destroyed the pictures your mind built up from the text.

With the coming of the Amiga, these graphics took a healthy step forward. Some can actually improve our mental simulations of places far away in space and time. Mouse control is a logical roll forward. Apart from suiting us lazy types, it is an excellent way to keep a good flow of play, especially in role playing adventures. In the jargon Dungeon Master is "third generation".

A new adventure in this category is Galdregons Domain from Pandora Software – good graphics, a smooth mouse and icon command structure, and a role playing game that will tax those little grey cells.

Had Galdregons Domain appeared before Dungeon Master it would have received better reviews. Dungeon Master has slick graphics with animation and you are prompted to tackle it in a very definite, systematic order. Galdregon is free ranging, has no animation, and although to win through you must solve some sections in a strict order, there are few hints as to that order.

You play the part of a barbarian, a northlander skilled in the use of arms. Seeking fame and fortune you visit the city of Secnar. There you are enlisted by its king in the fight against the evil priests of Shool.



Resting at an inn. Mine host is the fat one, and a cleric stands by to sell you healing

The priests have resurrected the long dead wizard Azazael, who intends to seek vengeance on all mankind. His aim is to find the five lost power gems of Zator and use them to control and enslave all who stand against him.

YOUR quest is to find the gems and return with them to the king. The location of only one gem is known – it is in the hands of an evil Lich, an undead wizard, who rules the catacombs under the city. You stand no chance at all against the Lich and his minions unless you can retrieve the other gems, gaining experience, weapons and armour in the process.

Leaving the castle you will meet many creatures, not all evil. Question them. Some will provide useful clues, some will merely pass the time of day.

There are mysterious cottages, inns, forests and towers to visit. Rangers, elves, gnomes and hobgoblins wander the countryside. You must be careful not to enter into battle too readily. Kill the wrong opponent and you could bring down the righteous wrath of his companions.

Leaving the castle you have only food, a lantern, a dagger and a healing potion. A visit to nearby cottages will provide you with a magic sword and a few magical scrolls. You are now equipped for the first stage.

Any weapon you find will sooner or later break in the heat of battle, so make certain you have a back-up weapon ready. Once you have overcome enemies you can take whatever they were carrying. Various small flasks will contain potions. Watch out for poison.

Scrolls are once-only magic spells written on human skin. They range from a simple spell to give light to useful offensive ones to summon up fireballs or poison clouds.

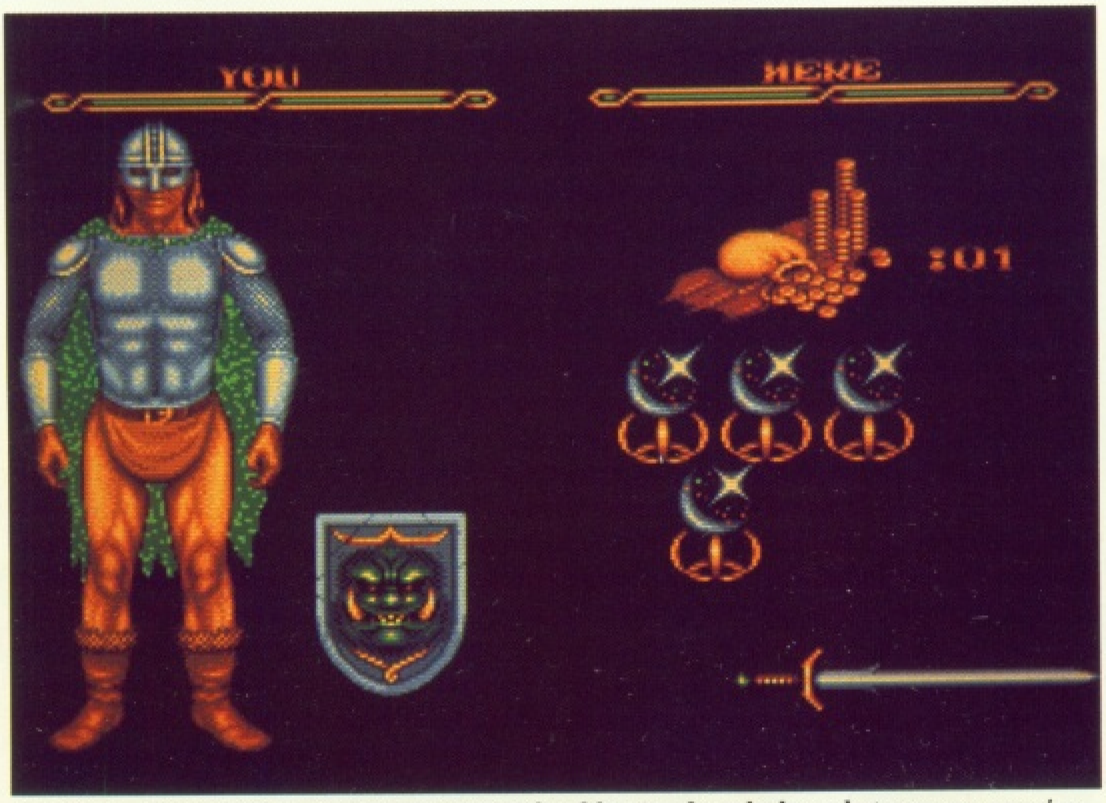
Half of the screen shows your view, beneath which is a line of sideways scrolling text. The lower part of the screen is the command area accessed with the mouse, icons and menus.

Food and drink affects stamina, healing potions or clerical cures. Strength can be won with potions or spells, and also appears to increase as you progress through the game and acquire better armour.

Click on the right mouse button and the display changes to the inventory screen, a picture of you on the left, and two pull-down menus showing you what you are carrying and what is on the ground.

Clicking on a dead body shows what the creature was carrying; click on a chest or bag to see what is

►

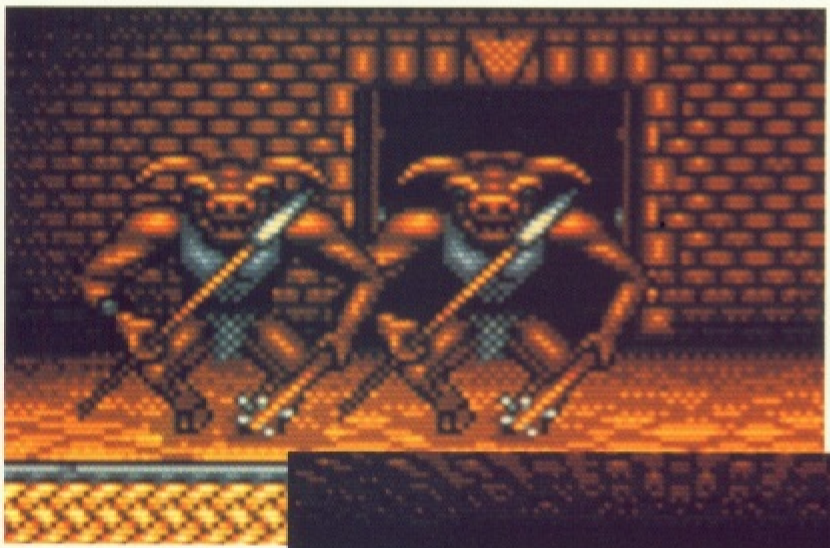


Inventory, showing the number of gems and gold coins found plus what you are wearing

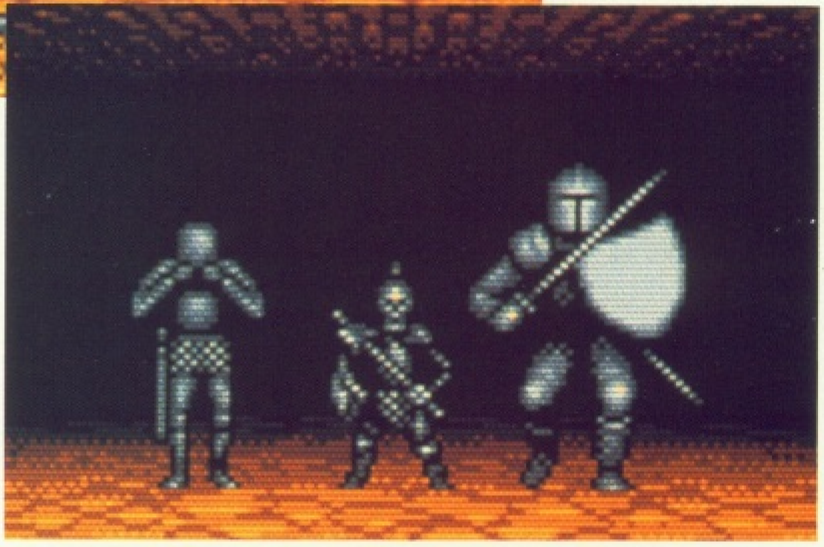
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inside. Items may be dragged from one menu to the other, although there is a weight limit to what you can carry around with you. Armour you want to wear should be dragged directly on to your body.

When out in the open, clicking twice on the right button displays a map of the countryside with a cross showing your location. It shows all except one of the major places of interest, although you may not realise their importance just from the map.



Ferocious minotaurs give battle in the depths of the labyrinth



Watch out for Medusa. Her face turns warriors to stone

MOVEMENT controls seem slightly strange. If you see a door in a building, but not exactly in the centre of the screen, you must go past the building and then turn towards it before you can enter.

Cottages are simple one-roomed or two-roomed buildings, towers are two storeys high and have a few more rooms.

Forests, the Caves of Doom, the Temple of Set, the Labyrynth and the Castle all have a number of locations and must be mapped very carefully. Note that walls, whether made of trees or brick, may not have any thickness, so watch what you draw on squared paper.

When you are in forests or underground caves there is an indication of when a path leads off to the left or right. In other locations what appears to be a continuous wall to one side may contain a doorway which is not visible unless you look directly at the wall.

Before you start make sure you have several formatted discs ready to save your game position. It is very easy to die in Galdregons Domain – most of the special locations have hordes of unpleasant creatures just itching to spill your blood.

It is easy to buy ale to increase your stamina, or a cure to improve your health. Unfortunately it is not as easy to find the money with which to pay for them.

Scrolls and potions have to be used to the best effect for the supply isn't inexhaustible.

My review copy seemed to have a few bugs that scattered the lower half of the screen with coloured pixels, a situation that grew worse as I progressed. Still, Galdregons Domain is a welcome addition for the role playing gamer. Let's hope there are some more like this in the pipeline.

REPORT CARD

Galdregons Domain
Pandora Software
£19.99

STORY LINE
Standard fantasy adventure in the true D&D tradition.

AURA
Come face to face with an ogre or monster snake and realise how puny the human form really is. Sound effects add to the atmosphere.

STAYING POWER
Frustrating until you find the order in which to approach your goal.

GAMEPLAY
Mouse and icon commands work well. Magic potions and scrolls feasible.

VALUE
Plenty of game for your money.

DIFFICULTY
Write down all the clues and don't be afraid to kill one of the good guys to get what you need.

OVERALL ***74%***
A cracking role playing game for the bloodthirsty. But lives in Dungeon Master's shadow.



Double click on the right mouse button to get a map of Mesron

ACTIVISION has always been a strong supporter of our computer addiction. Infocom, Sierra, MicroIllusions and Abstract Concepts are all names associated with computer adventures, and 1989 looks like being a bumper year for Amiga conversions.

The King's Quest series (I, II and III) has taxed more than 750,000 adventurers. Tens of thousands of words have been written in the USA on how to play these adventures, so they have got to have something going for them.

King's Quest IV will appear shortly on the Amiga. It is going to be a big program, which means there is going to be a fair amount of disc swapping as you progress. One IBM version has nine discs...

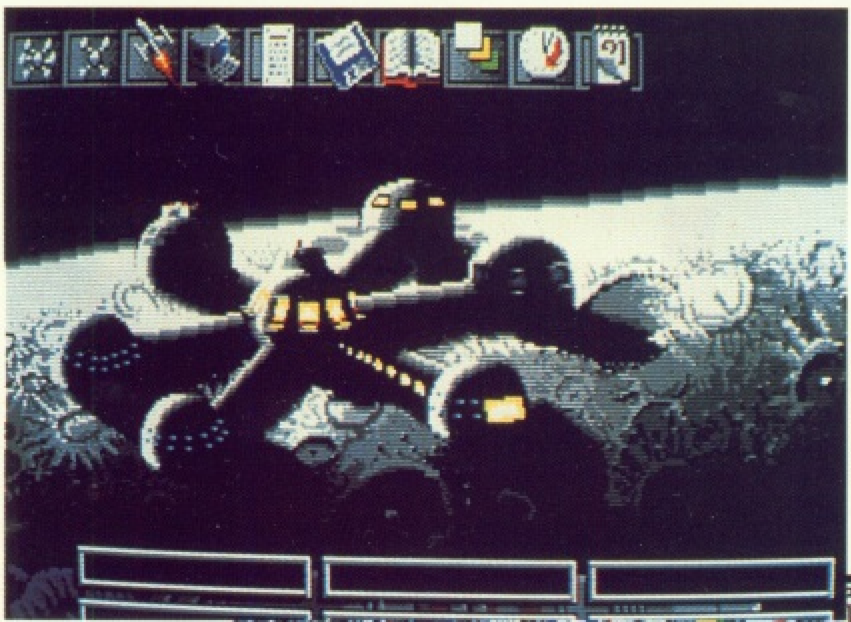
If medieval type fantasy is not your thing then Sierra may still have something to interest you. There is Leisure Suit Larry II – Looking for Love. It's an outrageous parody where Larry, still intent on finding his dream girl, gets involved with everything from foreign agents to Hairy Krishnas.

For something a little more serious you could try Manhunter, a science fiction epic set in New York a couple of years after an alien invasion. You play a detective hired by the aliens to keep track of their human underlings with the option to play either the good guy or the bad.

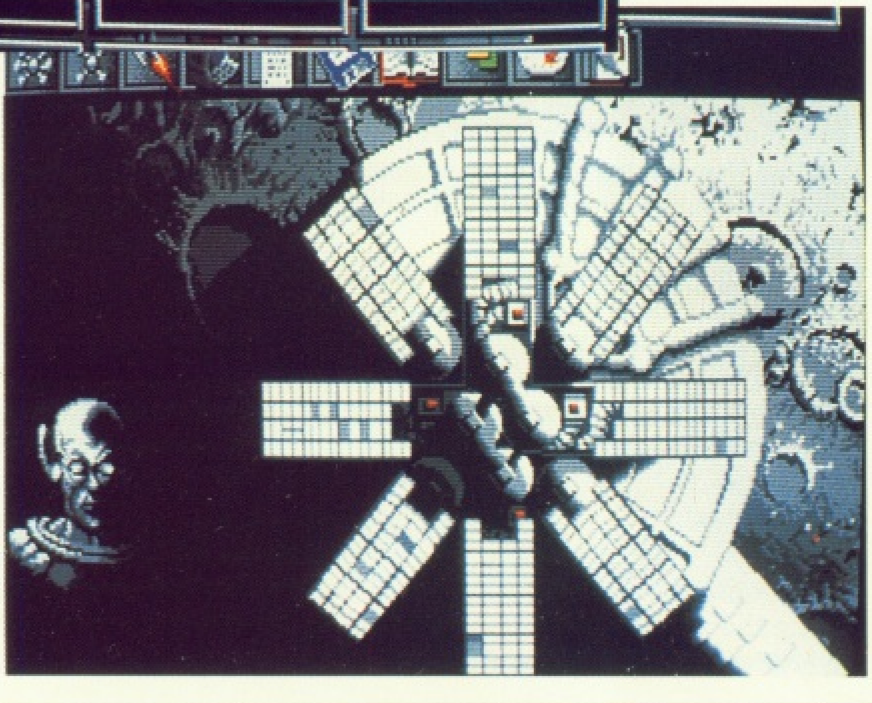
MILLENIUM 2.2, is also set in the future. It is a strategy adventure set on the Moon shortly after an asteroid collides with Earth, making it uninhabitable. Your task is to transform the planet back into a habitable condition for the future.

It looks fascinating; you must initiate research into various forms of transport, weapons and power sources, send out probes and mining expeditions around the solar system and generally develop the technology required to achieve your aims.

Not only is Millenium 2.2 a first class game but for those interested in astronomy it is an education to view the correct orbits and relationships between the planets and their moons.



Activision's Millenium 2.2, a strategy adventure set on the Moon shortly after an asteroid collides with Earth



Millenium 2.2 looks fascinating. You must send out probes and mining expeditions around the solar system to develop the technology needed to reach your goals

STUCK?

DUNGEON MASTER

● *Got characters that have no magic?* The wand found on level three will give them some starting mana – then practise like mad.

● Only attack Beholders when their eyes are closed.

● Top food calories go to dragon steaks, then rat drumsticks, then bread. Least nutritious are the worm rounds.

● *Want extra strength?* Cast Priest spell LO (to MON) FUL BRO KU into a flask.

● *Can't get into level six?* The answers to the riddles are blue gem, bow, gold coin and nothing. Put these items in the recesses and the door will open. You can pick them up afterwards.

● To get the sword protected by poison darts on level 11 break down the door so that you can get out again quickly. Strip off heavy armour before you run into the room.

● Before you kill the dragon on level 13 make sure you pick up some copper coins and drop them by the door to the Altar of Rebirth. Then if you have dead companions you can pay to open this door quickly when necessary.

● If you are having trouble killing the dragon, keep dodging to his side or behind him. Hit him quickly before he has time to attack you.

● *Can't get the Power Gem?* ZO KATH RA creates a ball of force that will replace the Gem when placed on it.

● Remember that you can only defeat the Dark Lord by trapping him *within* a flux cage using the Firestaff plus Power Gem. Create flux cages *around* him, not on him.

Let us know if you have any interesting solutions to puzzles in adventure games on the Amiga. They may well be where other people have got stuck and are just waiting for your hints and tips. Send them to:
Adventure Tips, Amiga Computing, First floor, North House, 78-84 Ongar Road, Brentwood, CM15 9BG.

Poor relation

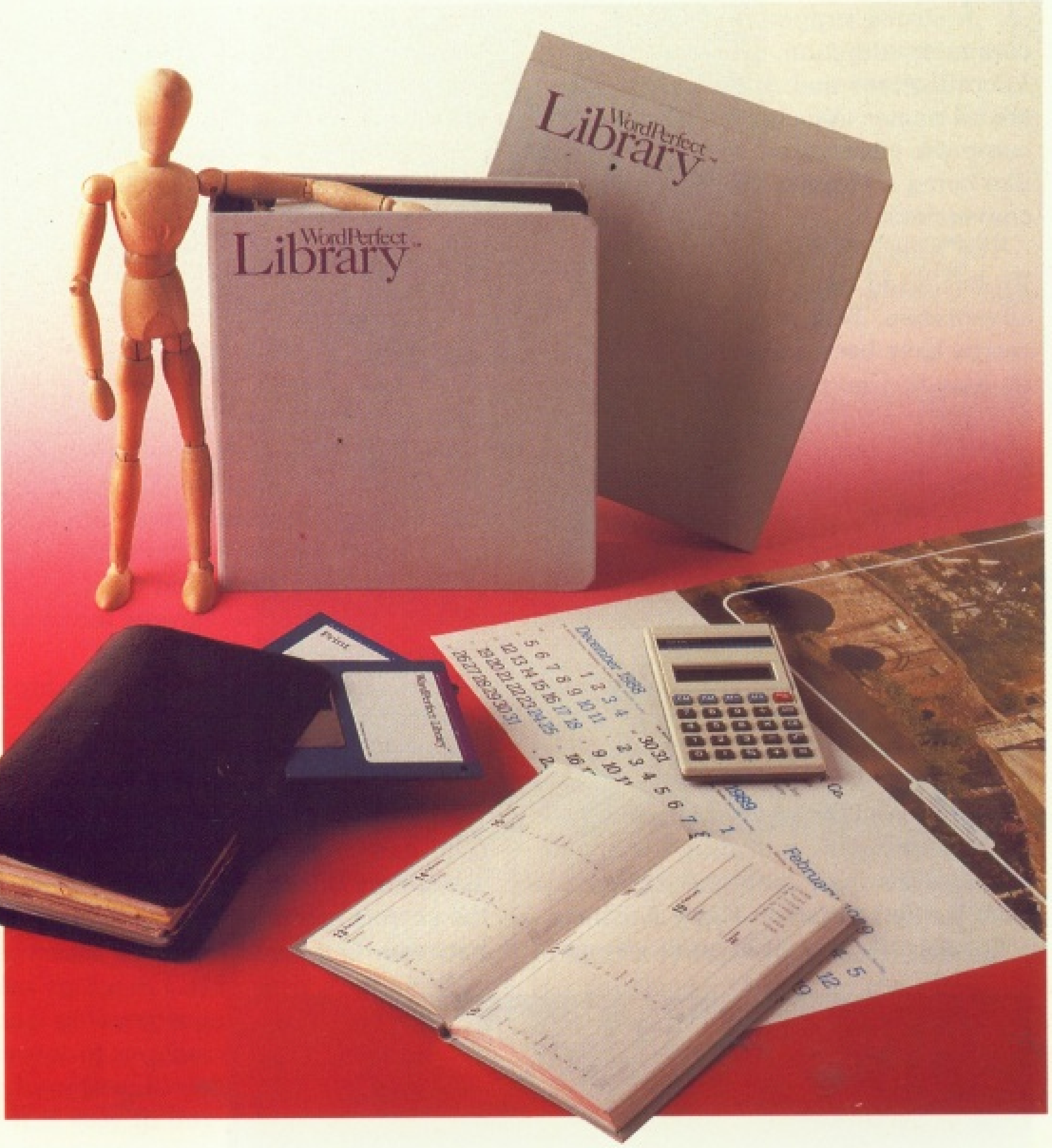
When a program shares its name with the world's best selling word processor you'd expect something special. David Foster did

WORDPERFECT Library is a group of programs covering a range of uses. It is not a single program or an integrated suite. They are not connected with WordPerfect, although the Notebook may be used to share data with it.

In typical WordPerfect fashion, the package consists of a large box containing a ring binder manual, two discs, keyboard templates and sticky labels for Amiga 1000 owners to mark their numeric pad keys. The program is not copy protected.

I sometimes wonder whether manufacturers price their products according to the size of the manuals. The WP Library one is more than 660 pages long and describes the programs in the most minute detail. It is divided into sections for each program and an overall section on installation and getting started.

No one could possibly criticise WordPerfect Corp for skimping the documentation. The whole thing is over-facing. In the tutorial sections, virtually every keystroke is described, mouse options being relegated to a brief mention on the right of each page.



Some of the programs make extensive use of the function keys with combinations of normal, Shift, Control and Alt, in much the same way as WordPerfect. This is something I have never really liked. I find it far from easy to remember all the different key strokes and had to refer constantly to the keyboard template.

Even though the manual gives full instructions for installation on everything from a single drive model to one with a hard disc, I think it is best suited to a computer with lots of memory and a hard disc. And if you have the sort of money WordPerfect Corp thinks you have you'll also have a hard drive.

The suite consists of five different programs – a File Manager, Text Editor, Notebook, Calculator and Calendar. All may be run from Workbench or CLI.

Guru meditation struck three or four times. One is repeatable and happens when using the Zoom gadget in the Calendar program. I was unable to repeat the others, which is a little disturbing with programs that might contain quite a lot of important information. The moral must be to save data regularly.

Each program is good, the Editor being the weakest. Deciding whether WordPerfect Library is worth the money is tricky. If you were to go out and buy individual programs to do the same jobs they would probably cost you a lot more than WP Library. But would you? This is a very expensive way to buy a flash calculator and file manager.

Even if you wanted them, have you got enough memory to load several programs at the same time? The whole point of programs like these is that to be of much use they must be to hand at all times. If they aren't they won't be used on a regular basis. I think you need about 2 meg of memory if you want to take full advantage of Library.

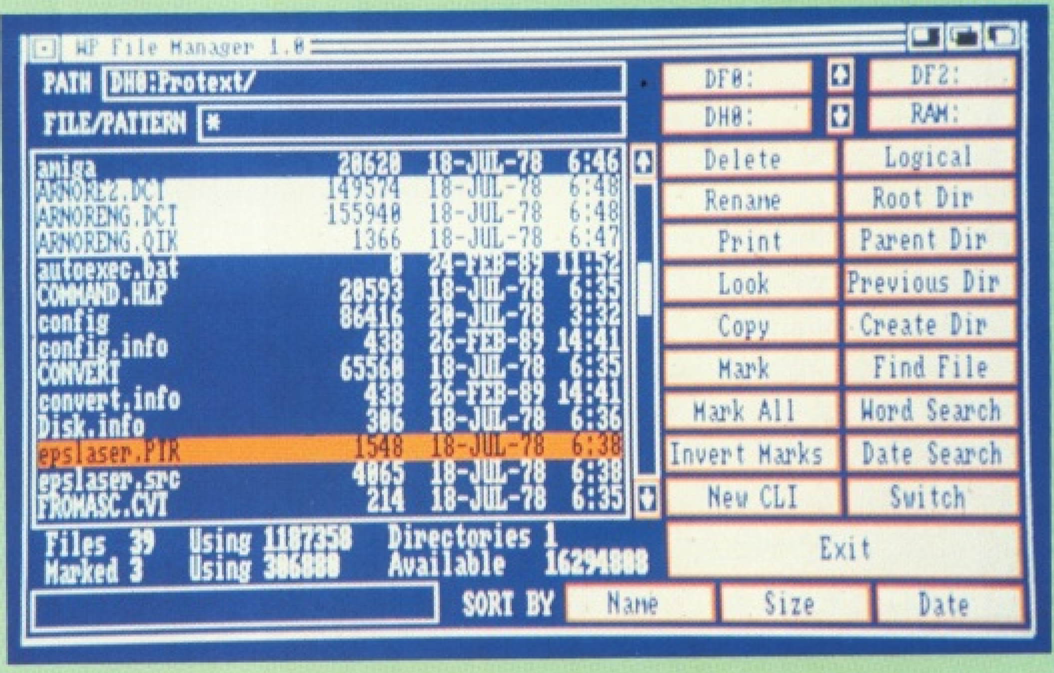
FILE Manager is a program to help with disc housekeeping. Its biggest advantage is that it lets Workbench see all the files on a disc, not just those with icons attached.

On the screen is a window which contains details of the first 14 files in the current drawer. The name, size, time and date last modified are shown. Three buttons let you choose between display in name, size or date order. The amount of free space and the number of files are indicated.

The right-hand side is filled with buttons. They provide options to change directories to Root, Parent or Previously used as well as Look at text files, Delete, Rename or Copy a file or group of files. The only omission is the option to view a screen.

You can create and delete directories. Files can be marked, moved, copied or deleted as a group.

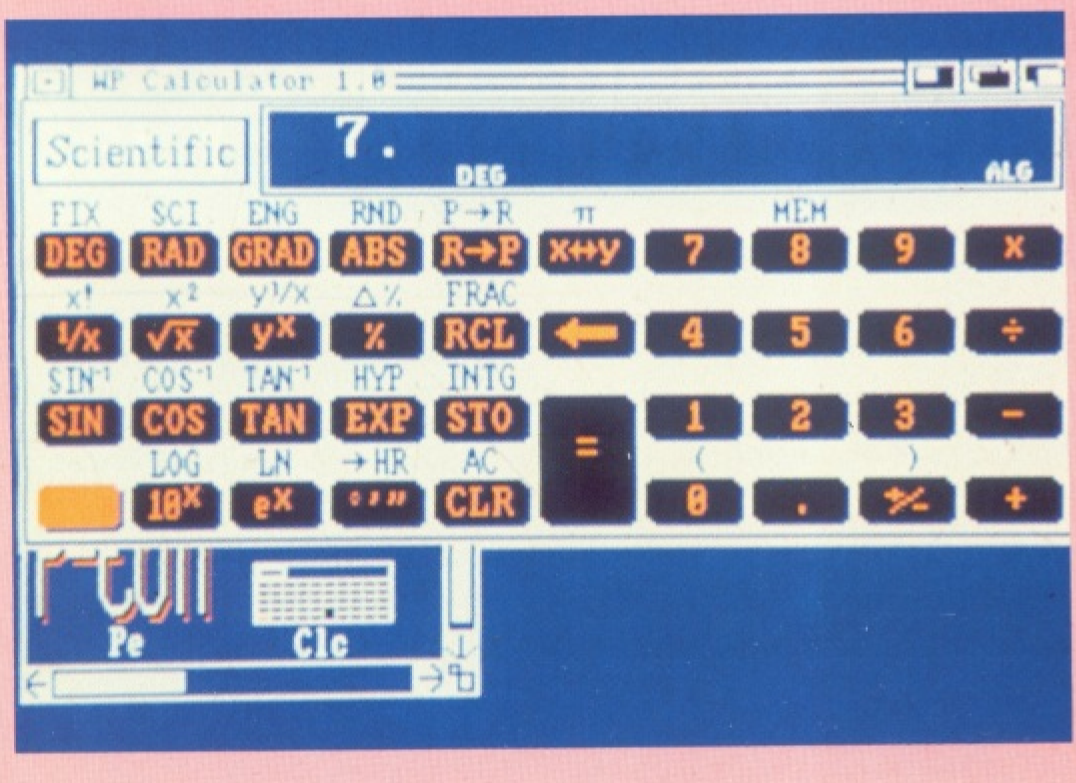
There are three different types of search – find file, find date and find word. Find file will scan the disc for any filename matching a pattern. The program betrays a



little of its PC origins here, as the wildcards used to indicate are the MSdos ? and *.

Date and word searches only work on the current directory. All files which match the specified range of dates are marked. In the latter, the search finds all files which contain occurrences of the specified word pattern and highlights them. The slow search can be restricted to marked files, which reduces the time taken.

Double click on a directory to move down the tree. Clicking on the Previous button returns you to the original directory. Another useful feature is an extra gadget on the right of the status line. Clicking on it closes the window, but leaves a small Status line at the top of the screen. Clicking on the gadget again will redisplay the File Manager screen as it was before.



CALCULATOR is a much more extensive product than the one provided with Workbench. Like File Manager, it can be shrunk to a single line on the status line when not needed.

Three different modes, Scientific, Programmer and Financial are available and just about every function you could possibly want is provided in each mode, including some that I never managed to get the hang of at college and others I have never even heard of.

Programmer interested me in particular, with its ability to work in hex, binary, octal form as well as decimal. Many other features, such as Shift, Rotate, AND, NOT and OR functions are available.

For the masochists of this world, Reverse Polish Notation can be used.

PROGRAM Editor is the one used by WordPerfect when developing its software. In view of this I was expecting something special, but ended up being a little disappointed.

Multiple files can be loaded and windows resized. If windows overlap, or you are editing more than one file with full sized windows, mouse control becomes very jerky.

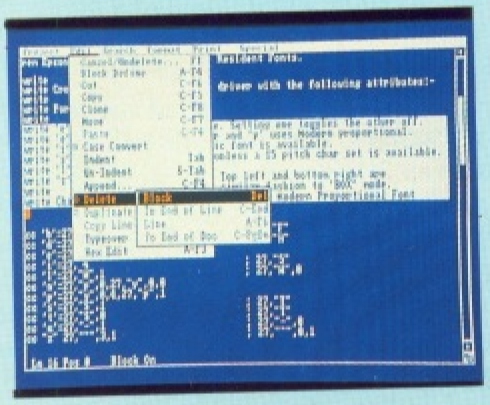
Unnecessary screen redrawing sometimes slows things down. The editor makes heavy use of the function keys. Wherever possible, they are given the same functions as WordPerfect.

The editor offers several special functions apart from all the usual Cut, Paste and Copy. Marked blocks can be converted to upper or lower case and the Duplicate command reproduces the line above the cursor. Auto-indenting is supported, as is the facility to indent or un-indent lines, or blocks of text – particularly useful when re-arranging source code.

It is possible to disable the scroll bar to speed up scrolling while a special Rewrite command is provided to redraw the screen and update the scroll bar at the same time.

There are complex macros with one macro being chained to the next as well as repeating or conditional macros. Macros may be replayed either by name, or by using a designated Amiga/key combination. Delays and pauses for keyboard input can be inserted into them and macros may be saved.

In spite of all its features, I did not feel at home with the editor, largely due to the inability to redefine the keyboard configuration.



NOTEBOOK is really a database. You can create a number of Notebooks which can contain different types of data. A list display shows data for a record on one line, with several records visible at the same time. When only some fields are visible they form an index of records which may be viewed in a separate display by pressing Return. A configurable record display can be created.

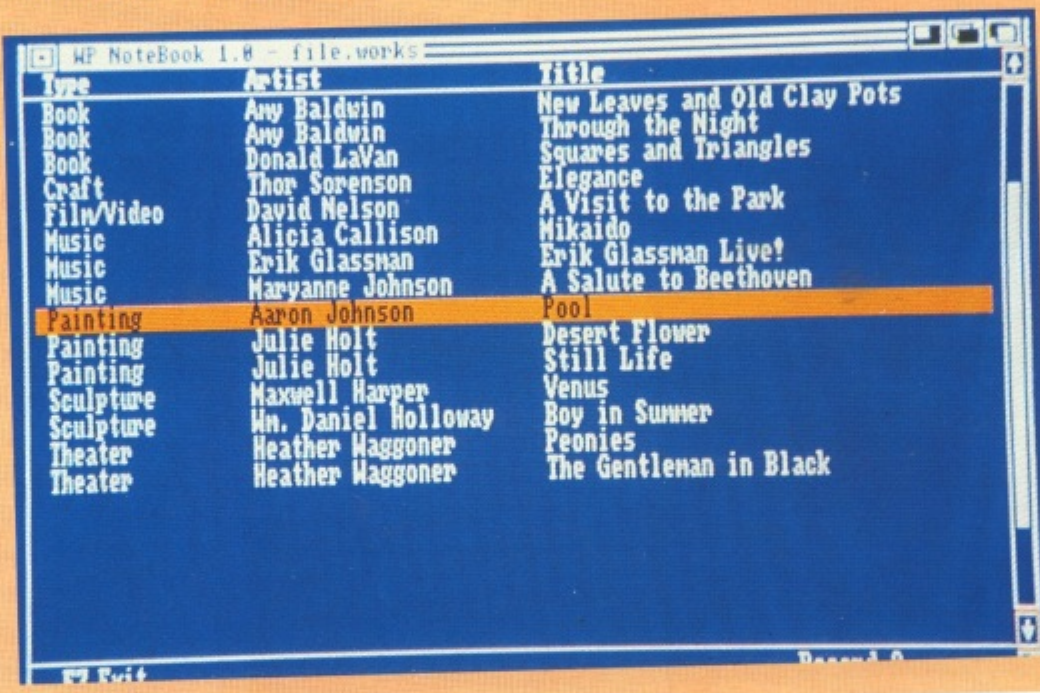
Facilities are provided for rearranging data. Sorting can be carried out on any fields displayed in the list. If identical entries are found further fields may be specified for ordering.

Specified text can be searched for throughout the database or restricted to certain fields or marked records. It is possible to mark occurrences automatically or manually in list view by double clicking on them.

Function keys are used, although options can be selected from pull down menus. Online help is available. Macros are supported and are implemented and used in the same way as in the Editor.

A Dialler option uses a modem to dial numbers stored in a phone field in records.

Printing facilities are comprehensive. Either the whole Notebook or marked records can be printed. Not surprisingly, full facilities are also provided to import and export WordPerfect Merge files.



CALENDAR is more than it sounds. It integrates an Appointment List, a To Do list and a Memo Pad with the calendar, in such a way that when you select a date it will display all the appointments for that day in their respective windows.

You do not need to display all the windows, and Calendar may be configured so that only the windows you use are opened when it is loaded.

Dates can be marked so that you are warned when an appointment is approaching. This feature is only implemented if you load an alarm program specifying the name of the Calendar file with the Appointments List. At the appropriate time a requester opens over your current program, displaying details of the appointment.

You can have priorities attached ▶



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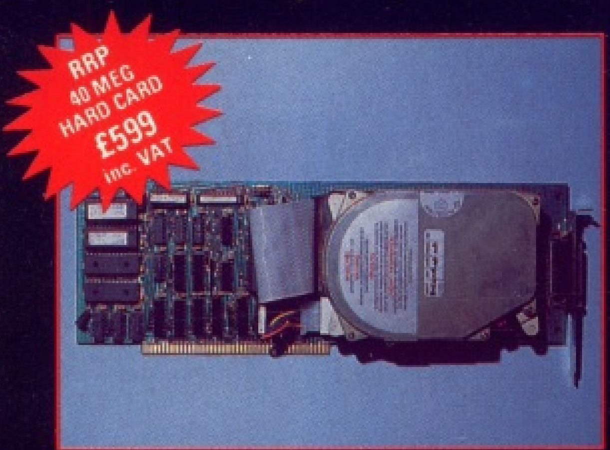


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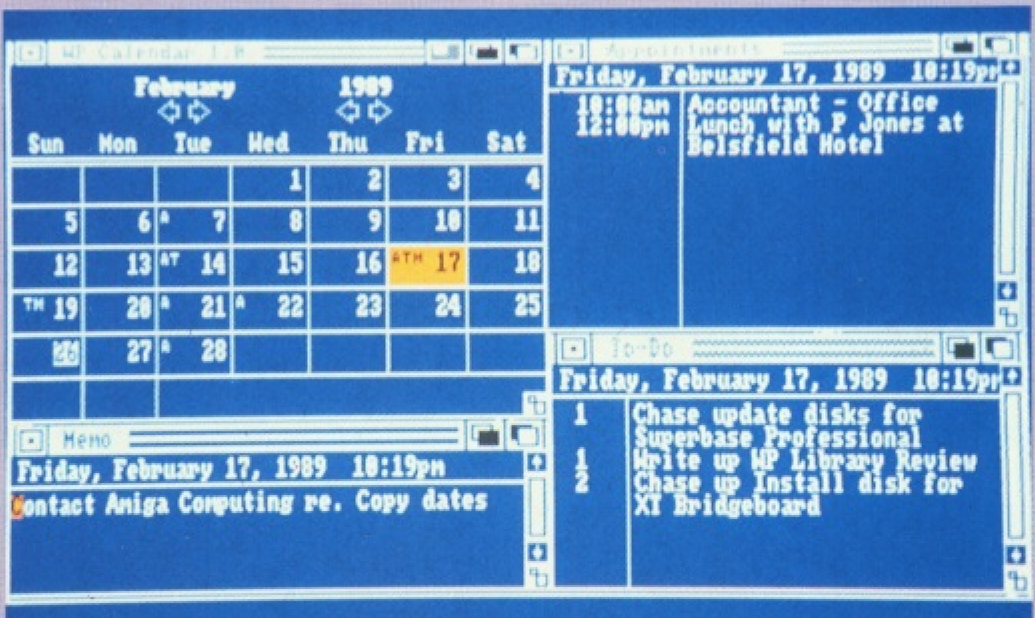
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to any entry in the To Do list and they are automatically rearranged if priorities are changed. When a job has been completed it can be marked as such and is automatically moved to the bottom of the list. Powerful search options can be used to look for any occurrences of text in the Calendar file with wildcards.



REPORT CARD

Library
WordPerfect UK 0932 231164
£99

EASE OF USE.........
The File Manager is ideal for hard discs. Other programs are useful if you can load them permanently. Function keys are far from memorable. Crashes.

SPEED....................
Nothing exceptional here, the screen redraws are a little sluggish.

VALUE ....
Good value if you want all the programs. but if you only want one or two, expensive.

OVERALL 54%

A good selection of programs, well implemented on the whole, but not the sort of package to buy unless you need most of the functions.

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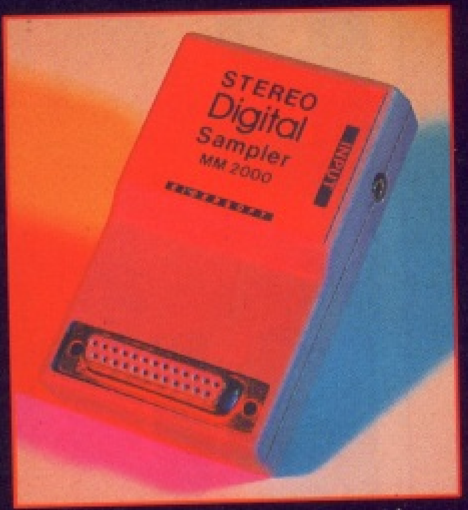
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Better but buggy

Rushing a product out can ruin its future, says Alex Aird as he compiles his views on GFA-Basic

FASHION dictates that hip coders use C. There are good reasons for this, one of the best being that it allows you to slag off programmers who use Basic. But the Basics are fighting back, offering the structure C programmers use as ammunition.

GFA Basic is one of the new breed, offering advanced features without having lost touch with its beginner's roots. It comes with an impressive A5 ring-bound manual in a library slip case. The manual describes GFA Basic as "an extensive programming language with a comfortable development environment".

Extensive is certainly the right word



– the manual, which is little more than a list of keywords, is over an inch thick. I didn't care too much for the documentation. Collecting keywords in logical groups seems a good idea, but I was constantly referring to the index to find commands.

There are a few amusing errors, probably due to the manual's German origins, and the odd line missing from some example programs, but no major disasters.

GFA Basic can be started from Workbench or CLI. When the editor is loaded you are presented with a single window into which you type your programs. At the top are 20 items which can be selected with the mouse or function keys.

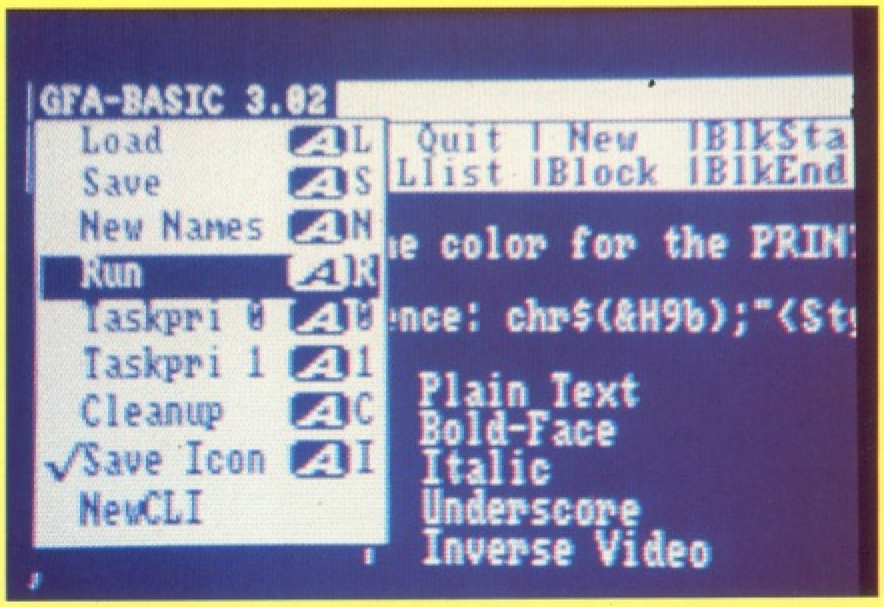
You can use an independent editor, thanks to multi-tasking. I tried running GFA alongside the small version of Protext with a 512k expansion and it seems to work OK. I found it quite handy to be able to try something out in Basic, save a demo program as an Ascii file, then switch to my word processor and merge the demo into this review.

THE first thing you will notice is that each line of the program you type is checked for syntax errors as soon as Return is pressed. An error must be corrected immediately. The editor will not allow you to enter another line until the error in the current line has been corrected.

GFA Basic does not use line numbers, and only one statement is allowed on each line. For example PRINT:PRINT is regarded as a syntax error. Loops are automatically indented, which helps program legibility when several loops are nested.

Program control is very important and is achieved by using loops and conditions. GFA supports several types. The usual ones such as FOR ... NEXT, WHILE ... WEND, REPEAT ... UNTIL, DO ... LOOP are there but have been extended in GFA to include DO ... UNTIL, DO ... WHILE, LOOP ... UNTIL, LOOP ... WHILE. There can also be exits from a loop using EXIT ... IF.

Even the humble IF ... THEN ... ELSE type of condition testing has been greatly expanded. A simple form



The only pull-down menu. All other options are chosen by clicking on the control bar

of this loop is:

```
IF a=1 THEN
    PRINT "a equals one"
ELSE
    PRINT "a is not equal to 1"
ENDIF
```

More complex forms of condition testing are supported by GFA:

```
OPENW 0
DO
    t$=INKEY$
    IF t$="L"
        PRINT "Load"
    ELSEIF t$="S"
        PRINT "Save"
    ELSEIF t$="I"
        PRINT "Input"
    ELSE PRINT "Unknown Command"
    ENDIF
LOOP
```

It should be noted that the keyword THEN is not obligatory. The whole structure of the condition testing employed in the above listing makes the program readily understood by anyone. The indentations are automatically put in by the GFA editor to make program listings more readable.

Another example of loop structures in GFA Basic is:

```
OPENW 0

DO
LOOP UNTIL MOUSEK

DO UNTIL MOUSEK=2
    DO WHILE MOUSEK=1
        LINE 0,0,MOUSEX,MOUSEY
    LOOP
LOOP UNTIL INKEY$=" "
```

This short listing allows you to draw a line by pressing the left mouse button – that is when MOUSEK=1. You exit the program by pressing the right mouse button or the spacebar. The DO ... LOOP makes the listing much neater than a WHILE ... WEND.

The GOSUB ... RETURN subroutine structure is supported in the form of procedures which can have local variables. The ubiquitous GOTO has not been left out but there are restrictions as to its use – no GOTOs just before a Return, for example. Structured programming is no bad thing especially for a newcomer to Basic; those who prefer pasta will have to adapt.

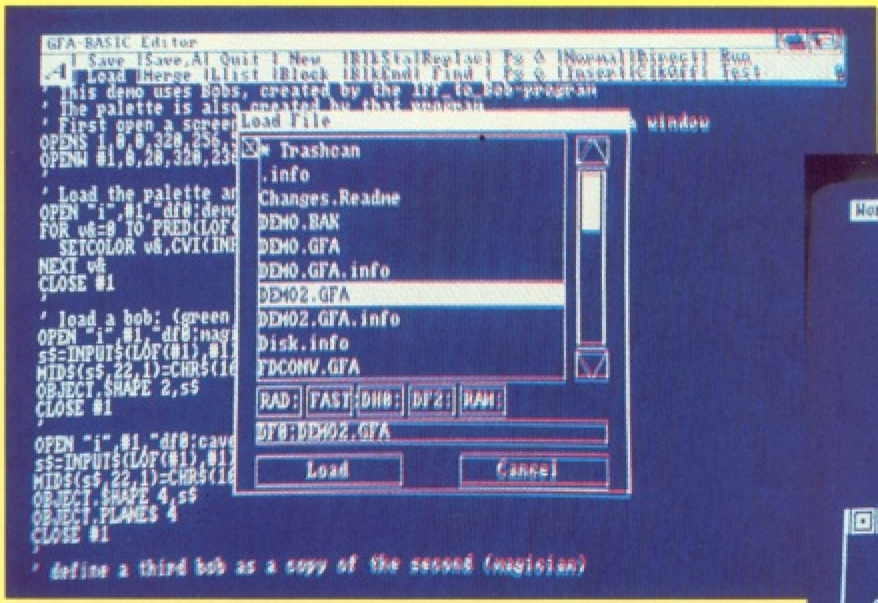
For debugging a program GFA has TRON, TROFF and TRACE$, allowing program execution to be traced. There are a few variations of these commands. One of the more powerful is the ability to send the trace output to a file or to the printer. For example to send trace output to the printer use the following.

```
OPEN "O",#1,"PRN:"
TRON #1
'
'section of program being traced
'
TROFF
CLOSE #1
```

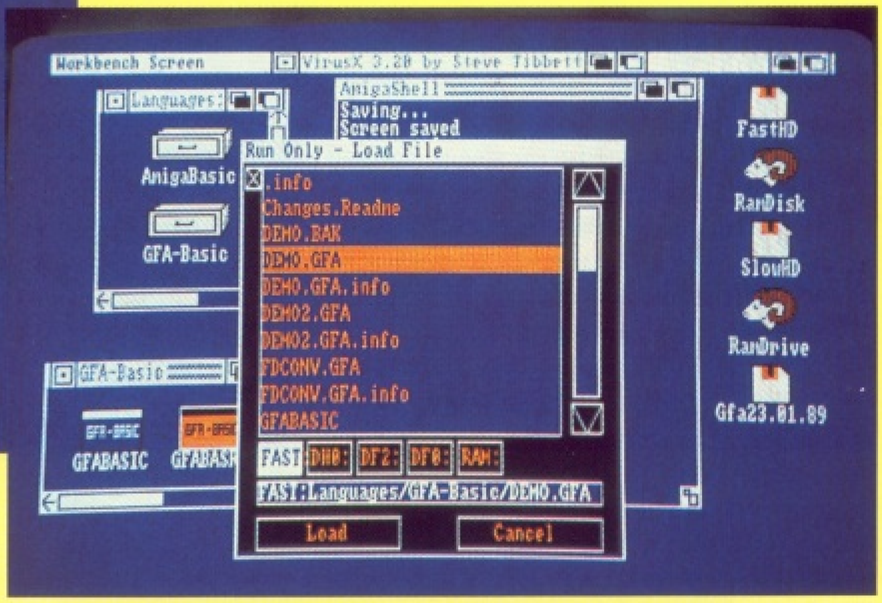
By putting a DUMP command within a program all variables, labels, procedures and functions can be listed during program execution. This list can also be sent to a file.

GFA Basic has many commands

▶



The device gadgets are worked out from the mountlist – the correct way to do it



Programs can be run without having to load the full GFA Basic interpreter

◀ that relate to file handling. All the usual types are supported such as sequential and random access files. In addition there are a few extra commands.

STORE enables the programmer to save a string array to a text file – I can hear those Spectrum programmers counting their pennies now. The complementary command RECALL reads back a string array. If the end of file is reached then no error message is produced, instead a simple variable holds the number of items read.

MENU commands let you add drop down menus to your programs. This is abetted by a simple way to include keyboard short cuts within the menu selections. For example, if the sixth item on the menu was SAVE and you wanted to add Amiga–S as a short cut, then add a single line MENU KEY 6,83. The symbol for Amiga–S would be added to the menu and the command ON MENU GOSUB would also recognise the shortcut. Submenus are created by putting an exclamation mark before the menu entry.

One of GFA's nicer features is the command FILESELECT. This is very useful when you want to load or save files from within a Basic program. If you write a database type program for example, you will want to load or

```
OPENW #0
DIM a$(10)
i%=0
DO
  READ a$(i%)
  EXIT IF a$(i%)="*"
  INC i%
LOOP
a$(i%)=""
DATA "Project","  Load/Save
DATA  "! Load      ","! Save
DATA  Other,*
MENU a$()
MENU KEY 2,76
MENU KEY 3,83
ON MENU GOSUB menuselect
DO
  SLEEP
LOOP

PROCEDURE menuselect
  IF MENU(0)=2
    GOSUB loadfile
  ELSE IF MENU(0)=3
    GOSUB savefile
  ENDIF
RETURN

PROCEDURE loadfile
   FILESELECT "Load File","Load","RAM:",a$
'actual load commands go here
RETURN

PROCEDURE savefile
   FILESELECT "Save File","Save","RAM:",a$
'actual save commands go here
RETURN
```

save data.

A little box is put on screen and a list of files in any directory displayed with just one line of Basic. Files can be selected for loading or saving by clicking the mouse button.

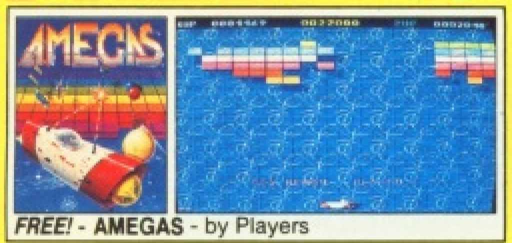
Producing impressive graphics is simple. And after a quick look at the demo programs I felt that it would be fairly easy to write good graphics programs using GFA. It has all the commands that you would expect such as LINE, CIRCLE, ELLIPSE, BOX, FILL, GET PUT and so on. Also some you may not expect, like SCROLL to move a rectangular area of the screen and an extended variation of the DRAW command which simulates Logo:

```
DO
  INPUT a$
  DRAW a$
  EXIT IF a$="EXIT"
LOOP
```

Now inputting fd 50 rt 90 fd 50 at the input prompt would draw a line 50 pixels long and turn the imaginary turtle 90 degrees to the right then draw another line 50 pixels long. To anyone who has ever played with Logo this would be quite familiar.

There is rumour of a compiler coming soon. When that appears ▶

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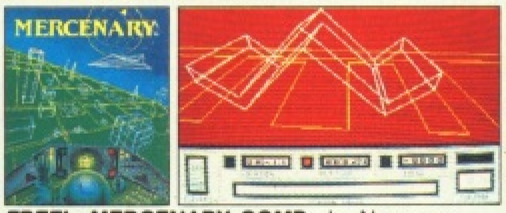


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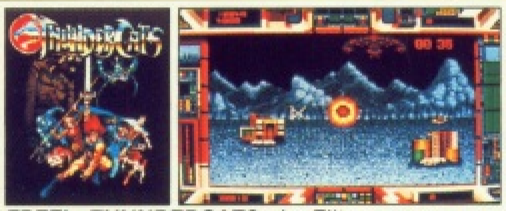


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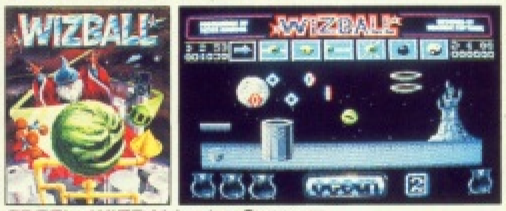


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◀

commercial programs might be written using GFA, but then again C seems to be the flavour of the month, especially on the Amiga. The first copy I had of GFA Basic was version 3.0. I had lots of problems with it so sent it back for a replacement. A week or so later, version 3.02 arrived.

On the disc is a file called changes.readme. This was a five page document detailing all the bugs that had been fixed, plus details of some new keywords that have been added.

This later version is not without its problems. The most serious perhaps is that the machine hangs after printing a program listing or after changing a disc. The only way out in either case is to reset.

When I got my second drive halfway through this review I thought I could load the Workbench from DF0: and run GFA from DF1: but GFA Basic will only autorun programs properly from the internal drive.

The search and replace function does not work, it will find but not replace. Changing between insert and overwrite mode puts another cursor on the screen. I had 10 cursors on screen at one point; quite confusing.

To enter direct mode you can either click with the mouse or press a function key. The effect should be the same, but it is not. I sent the disc back a second time because of these problems, but after more than two weeks I have heard nothing more from Microdeal.

This product has been rushed, leaving the unfortunate purchaser to do the what should be pre-release testing. What GFA Basic does, it does well. It is faster and nicer to use than AmigaBasic and has some good extra features. And despite the bugs I like it.

I get the feeling though that it will get a bad reputation and never be considered as a serious tool for Amiga programmers. This will be a shame because with a little more work it could be the best.

REPORT CARD

Product GFA Basic
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Price £64.95

EASE OF USE
OK until it crashes. You need to reload after doing minor things like swapping floppy discs.

SPEED
Very much faster than AmigaBasic, especially when using graphics.

VALUE
I wouldn't go out to buy GFA Basic, after all AmigaBasic is free.

OVERALL *56%*
A missed opportunity, but it's not too late for the programmers to fix.

AmiExpo

America loves Amiga

Simon Rockman reports from the Amiga Show in New York

ELEVATORS which feel like helicopters take some beating. AmiExpo New York was held at the Marriott Marquis Hotel, which is distinguished by having the tallest atrium – or lobby – in the world. The glass lifts whizz up and down the 50 floors at breakneck speed, taking a couple of floors to slow down.

New York is famed for magnificent skyscrapers, but the Marriott manages to provide spectacular sci-fi style views inside the building.

Attending AmiExpo is not cheap. At around $1.75 to the pound, tickets which cost $20 for one day and $30 for all three days worked out at between £11 and £17. There were a number of intensive classes on using the Amiga as a video tool, the art of Amiga art, programming in C, using the Amiga for music, desktop publishing and animation.

The art classes were taken by James Sachs, who also gave a talk on pushing forward the quality of Amiga software. He showed a video tape of his current project, 20,000 Leagues Under The Sea, which is being produced in conjunction with Disney. The game is still a couple of years from completion. Most of the graphics are finished and he is now working on the programming.

This is pure machine code. James has no truck with multi-tasking or C. The demo was spectacular, with the kind of graphics that make even blasé Amiga owners applaud. But what will turn it into a really special game is the music and the load speed.

The Nintendo games console has been very successful in the US and Mr Sachs contends this is because cartridge games load instantly. 20,000 Leagues will start running within a second of putting the disc in the drive and be playable within three seconds.

JAMES revealed a couple of home truths about Roger Rabbit. He admits the game has a couple of problems because it was rushed out in 90 days on the Amiga, PC and C64, but he is proud of the quality of



The portable Amiga – mono only. It costs $2,200 from Micro Momentum

animation which owes more to the traditional cartoonist's skill than any computer game previously.

What made the video special was the sound. The game will have a Wagnerian soundtrack produced by mixing samples from a collection of digitised instruments. James admits to tipping his hand to other software developers, but would rather see the standard of games improve than live with hissy samples.

The music course was run by Dean Friedman, the musician famous for hits like Lucky Stars, Rocking Chair and Lydia as well as the music for Boon. Dean is acknowledged as something of an Amiga Midi expert in America where he runs the New York School of Synthesis. Look out for his articles on the Amiga and music in future issues of *Amiga Computing*.

The show provided a chance to meet a lot of the people who have made the Amiga – not the big companies, but the user groups and magazines. There were several stands selling PD software; programs to do pretty much anything you wanted were available for $4 a disc.



Allen Hastings had some great new demos

NEWTEK showed the Video Toaster (again). It looks as though this super-duper video mixing card for the A2000 really will go on sale this summer in NTSC form. But a PAL version is a long way off.

Tim Jennison, the owner of NewTek, claims that a European version is pretty tricky. The higher definition we have on our televisions means that the card needs more ram and quicker processing. The problems are exacerbated by British companies being much fussier about the quality of television pictures than US stations.

But Tim admits there is probably a big enough market to make the project worthwhile. Just as soon as the NTSC version is out and he has had a holiday – sorry, vacation.

Other attractions to the NewTek stand were DigiPaint III, which will be available soon, and a stunning demo by Allen Hastings. NewTek glossed over the jump from DigiPaint to DigiPaint III without the usual business of messing with a DigiPaint II. Perhaps the spectre of Deluxe Paint III was looming too large.

R&DL productions were on home territory and used the show to launch Lightbox, a drawing program which allows an animator to see frames of a cartoon as though they were drawn on layers of tracing paper. Individual frames can then be saved and coloured in using something like DPaint. R&DL has applied for a patent on the system.

Impulse Software had some demos to go with Turbo Silver and promised Turbo Silver III soon. This habit of not having a version II is catching.

The company also showed a 3D system like the Haitex using the Sega glasses. It allows up to four players to take a squint and they look more like Ray Bans. It's hard to act cool, let alone save the universe, wearing a welding mask. This combines with Silver to produce great 3D animations.

Impulse also has a musical instrument. You sing into a microphone and an interface converts the sounds into musical notes. This will cost $199.

MICHTRON and Microdeal were showing Viva, an interactive visual authoring system which is aimed at the computer based based training market. It uses a standard video disc player and the Commodore A2300 genlock. There are three versions of the software, costing between $50 and $600. Michtron is selling the HiSoft Basic compiler in the US, along with a number of familiar UK programs.

Soft-Logik launched Pagestream. This DTP package has been a success on the ST and now aims to repeat the performance on the Amiga. The software costs $199.95 and offers advanced text editing with spell checking in addition to the usual DTP functions.

It will produce colour separations, so that high quality colour can be produced by getting a proper printing company to run off pages, and supports colour printers. Pagestream will also produce high quality output on non- Postscript printers. A full review will appear in *Amiga Computing* soon.

Syndesis announced a couple of improvements to its range of shape translation programs. Interfont can turn normal bit-mapped Amiga fonts into the wire frames a program like Sculpt 3D needs. It will also allow you to edit the shapes, and has recently been upgraded to include the Ageis Draw format used by Professional Draw and Turbo Silver 3.0 format.

A departure for Syndesis is the move into networking software. Bob Tolly has written a DECnet emulation which uses the serial port and allows the Amiga to be connected to a mainframe as though it were a dedicated terminal. This should be help establish the Amiga in the high end workstation market, but I can't ▶

AmiExpo


Søren Grønbech – you probably know him as Sodan

see any sales to home users.

The Amiga has always attracted users who want to do more and go faster. With the official Commodore A2620 on sale, third party companies have moved up market. Great Valley Products announced a 68030 card for the A2000. This will be available in 16 and 25Mhz versions, which at a guess will be between 10 and 15 times faster than a standard Amiga.

Some clever circuitry lets the 68030 run faster than the rest of the computer and still access the memory at maximum speed. A socket allows for a floating point co-processor. GVP also announced a 44 meg removable hard drive for the A2000.

GOLD DISK did not have a stand at the show, but took the opportunity to announce a number of new programs and some hardware. Design 3D has been previewed before, but at AmiExpo it was nearly finished and looked really good.

It is a modelling program which interfaces with Videoscape but has a friendly front end. Objects can be created in 3D with four views – top, front side and perspective. Up to four light sources can be used. It looks a useful tool, but a bit pricey at $99.

More exciting, for me at least, was Transcript, the second program in the new Gold Disk home office series. It is billed as a writing/editing tool, but is really a word processor.

Transcript is designed to be small and quick to use, ideal for multi-tasking with Pro-page. There is a 90,000 word spell check which can be run as a separate task. A special mode lets you see – but not alter – what output will look like. At $69.95 it looks a good buy.

I said it was the second Home Office program. The first will be Home Budget. This is a book balancing tool which helps look after things like home bank accounts.

The first move into hardware is an interface for the Canon IX12 scanner. The scanner will read an A4 page in 15 seconds at 75, 150, 200 or 300 dpi and turn it into an IFF file. It is set up to use fast ram because an A4 black and white page gobbles up a meg at maximum resolution. The US price of $1,095 is unlikely to be reflected by the UK price, where the scanner costs £1,400 for the IBM PC.

One item of hardware seems to be particularly popular with developers at the moment – the multiple serial board. ASAP in Scunthorpe is about to release Amiox, an eight parallel, eight serial port device.

CMI from Oregon announced CMInet, a networking card with two serial and one parallel ports. This includes some custom software.

ASDG launched the incredibly fast DSB or dual serial board which adds two extra RS232 ports to the Amiga. Perry Kivolowitz from ASDG showed me two Amigas linked with the cards and transferred a file between them at around 10k a second. The card costs $299 and will be a useful peripheral for A2000 owners with several machines.

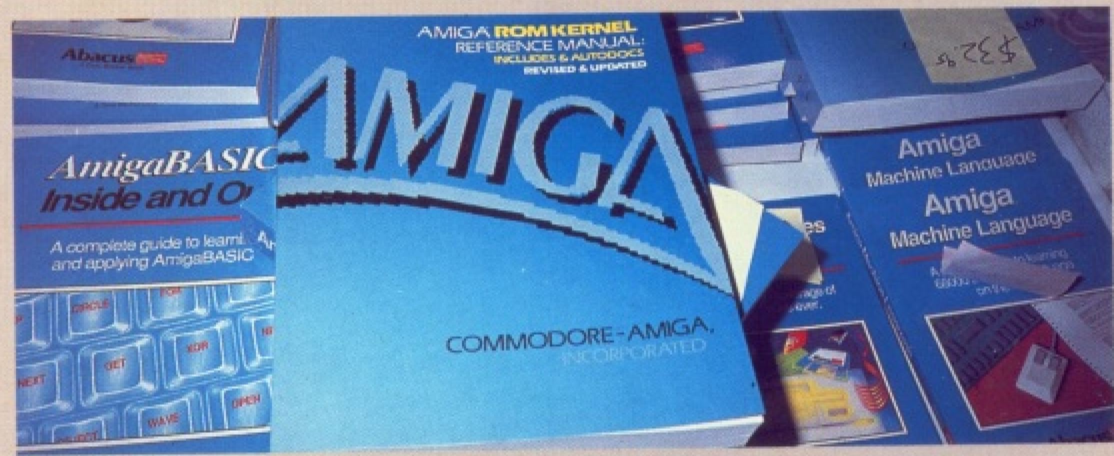
Games were very low key. Psygnosis was showing Blood Money, an impressive Menace type game for two players, on its stand. A novel feature allows players to buy weapons by collecting money dropped from the aliens they shoot. You will have to get on well with a partner to get very far.

The only other games software house was Visionary Design Technologies – responsible for Dragon's Lair – which has now moved on to more traditional games, a defender clone called Questron and a funny breakout in the round called Vortex. Questron is by Søren Grønbech the programmer who wrote Sword of Sodan. He has now moved to Canada and is on the Visionary Design team.

Many Amiga owners have asked for a portable Amiga. Dale Luck, from Commodore-Amiga built himself one using an old SX-64 case. The small screen is far from satisfactory so Micro Momentum has come up with an Amiga in a briefcase design which uses an amber monitor. The whole thing looks very Heath Robinson, so I can see technology has a lot of catching up to do before a portable Amiga becomes viable.

THERE was a lot to see in three days, which made for a great show. American Amiga users are a great and dedicated bunch. They obviously get a lot out of using their machines and the healthy PD libraries are a tribute to the work they have put in.

Lots of people seem to have A2000s and A500s with hard drives and it was the quality of visitors which really made the show. New York obviously likes AmiExpo. It's a bit of a shame I wasn't keen on New York.



The new version of the Exec documentation. It will be here in June

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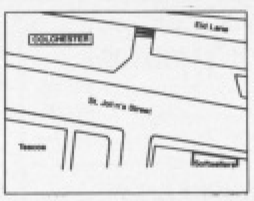
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Icon see clearly now



Rupert Goodwins looks at a utility to provide you with a broader palette

EVERYONE knows that the Amiga can display 4,096 colours, but it's hard to credit, looking at the vivid orange, china blue and Daz whiteness of the normal Workbench display. There's no hint in the Amiga manuals as to how such dayglo diversity might be obtained. It seems that you are expected to be happy with just the four that Commodore gave you.

This is silly. At least, Hi Tension thinks so, as it has brought out Icon Paint to warm up the Workbench and give you the power to iconise your own programs. Icon Paint is really a set of programs which can switch the Workbench between 2, 4, 8 or 16 colours, create, edit or import icon images, and generally give Amy a fresh coat of makeup.

Booting from the Icon Paint disc gives an immediate indication of what is in store. The Workbench is switched into 16 colour mode, with several subdued colours mixed with shades of grey – very attractive. The disc icon looks like a solid 3.5in floppy and double-clicking on it draws the metal shutter back to reveal a realistic disc surface. There really should be a sampled sound effect to go with that...

The Icon Paint window is dominated by the icon of the editor package. Below that are various other icons for the new programs provided, as well as buttons to switch the number of colours in use. Hi Tension has redone most of the standard Workbench icons, and hidden away on the disc are a number of impressive multicolour pictures, as much there to show what can be done as to be serious alternatives.

The editor package is the largest program on the disc. It has two windows, in which icons up to 320 by 100 pixels can be edited. One window is for the "normal" icon, the other for the icon after it has been selected.

The editor is, for a world satiated by PixelPaint and awaiting Deluxe Paint III, rather crude. There are gadgets to fill an area with solid colour, type in text, draw lines, boxes and circles and not much else. The magnify function works rather slowly, and it gets unusable if you draw on the main screen over the area being magnified.

But all this doesn't matter, because the program will load and clip to size any IFF picture file. You can mess around with your picture to your

▶

heart's content in your favourite graphics utility, and turn it into an icon when you're quite happy.

Those with video digitisers can capture their favourite rock stars, scale them to fit and get them to stick their tongues out when the icon's selected. Just don't ask me why.

The editor allows you to set what sort of file will be associated with the icon when it's finished. Task is used for programs, Project for files which contain data for programs, and so on. It's a neat way of providing programs you use with their own icon and a presence on the Workbench screen.

Other programs are included to smooth the introduction of this chromatic extravaganza. One is a palette program which sets up the colours just so. There's another, called Dircol, which lets each Workbench draw have its own colour settings by loading information from a colour map file.

Finally, there's Getcol, which extracts colour information from any IFF image file – though not a HAM image. You want a HAM Workbench? You write it! Between them, they more than compensate for the Preferences program only controlling the four standard Workbench colours.

There are also a couple of utility programs to create a second Workbench or kill one off. I'd have preferred to have been able to load an IFF picture as a backdrop to the main Workbench – I've seen some PD software on an early Fish disc that does this, and it would have added a nice touch.

At first I had considerable problems with Icon Paint. Icons on old discs consistently corrupted the screen, crashed the computer or left droppings all over the place. A quick phone call to Hi Tension revealed that I hadn't read the ReadMe file (cue a 16 colour reviewer's face) and many icons were corrupted themselves, but for the normal four colour Workbench this didn't matter. Throw them at the 16 colour version and things break down.

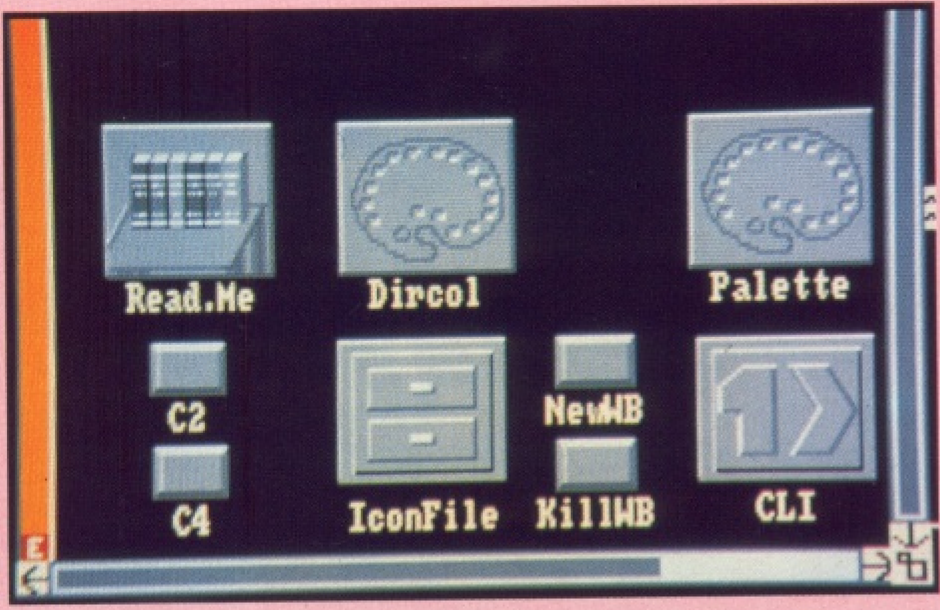
The cure is to load the icons into the editor and save them out again. This works in all the cases I tried – I couldn't resist the temptation to modify the pilot's head in Interceptor and stick a smiley on his helmet.

There was still the occasional odd corruption on screen; whether this was from an icon I'd missed or some deeper malaise I'm not sure. Whatever, it wasn't nearly nasty enough to rouse me to investigate further.

The documentation was adequate, apart from using "it's" for "its" throughout. The biggest annoyance of the whole setup was the copy protection – there are no restrictions on the number of times you can make backups, but whenever you want to use the editor you need to have the original disc to hand, otherwise the program won't run.

It's not the sort of thing you do to a utility which people might buy to make their livings from. Not to mention the annoyance it causes to hard disc owners.

Icon Paint lets you choose between speed and beauty on your Amiga. A two colour Workbench is faster for text painting and window movements and uses less chip memory; a 16 colour version is slower and hungrier, but looks so nice. Altogether a worthwhile utility.



Subtle shading is often more effective than vivid colours



The software comes with a range of icons

REPORT CARD

Product Icon Paint
Supplier Hi Tension
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USEFULNESS
While a prettier Workbench is very nice it isn't really any great use.

EASE OF USE
When you have conquered the problems caused by buggy icons it is simple.

INTUITION
Although designed to work within the limits of Workbench, it is bound to break some AmigaDos guidelines.

SPEED
The extra bit-planes needed to add new colours take time to blit and so makes the system much slower.

VALUE
There are few games you can buy for less than £20, so a utility at this price really is a bargain.

OVERALL *57%*

Saved by the price, a fun, frivolous utility, but it is quite cute.

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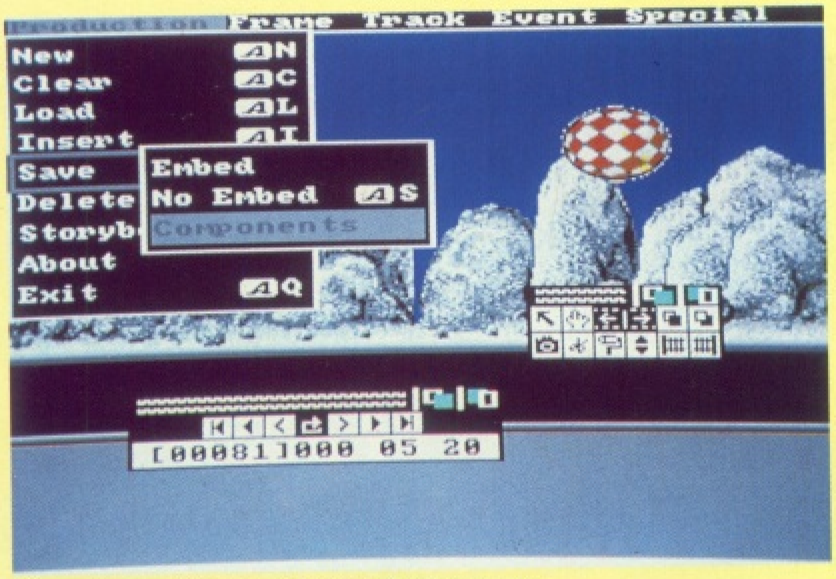


What's up, Doc?

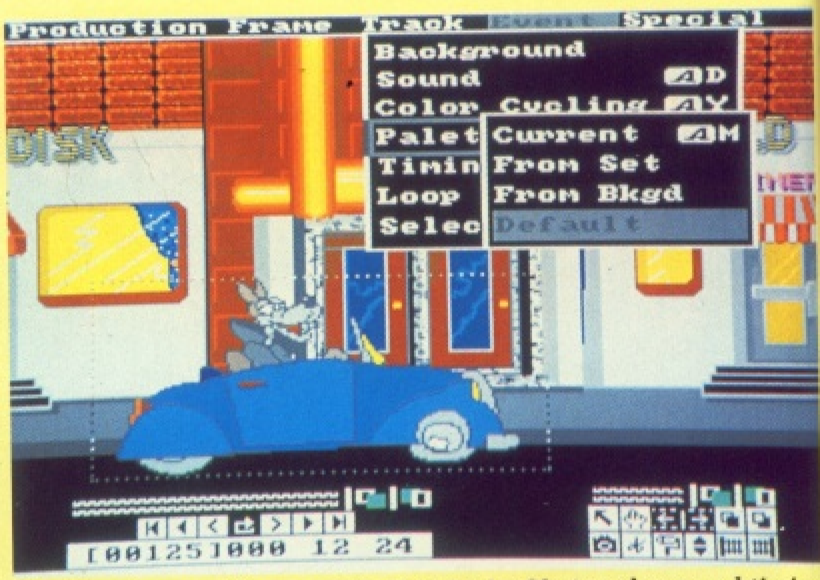
John Kennedy finds that animating Bugs Bunny is as easy as chewing a carrot, provided you've the memory

SUPERB graphics are what sells the Amiga, mostly through short animated demo programs and the occasional appearance on a Channel 4 music programme. The blitter, the large choice of colours and an overscan mode whereby the whole screen is used with no borders makes it the ideal, cheap way to produce professional looking results.

However to achieve anything that looks in the least part useful you would first need to spend a lot of time learning machine code and reading volumes I to X of the Amiga hardware specification. Realising this, several software companies have released packages that do all the programming – you just supply the ideas and the drawings. MovieSetter ►



Three types of save on the Production menu



The Event menu allows you to change the film's colours and timing

claims to be the first wysiwyg animation program for the Amiga. It comes in a large box on two non copy-protected discs with a 68 page manual. It claims to need only an A500 with no bolt-on memory or extra drives to run.

Now I am no artist – drawing the curtains is large enough strain for me – so I must be the ideal person to test an animation program. If I can achieve anyning worthwhile, it must be good.

The disc auto-boots and leaves you on a Workbench. Clicking open the disc reveals several icons including MovieSetter, ScreenEditor, SetEditor and MoviePlay. The last is a freely distributable program that will play your finished animations. This means you can give all your friends copies of your epic productions without breaking any copyright laws. I wanted to keep my friends, so I kept my animations to myself.

MOVIESETTER brings its own set of jargon, unavoidable with a program of this complexity. In some cases the choice of words leaves a lot to be desired because they might easily confuse the beginner.

The word *set* is used very frequently but not, as you might expect, to describe the environment in which the movie takes place. Instead, a set is a collection of *faces*, and faces are all the possible drawings of a particular *object*. Thus the SetDesigner program allows you to edit the actual characters and objects you wish to animate.

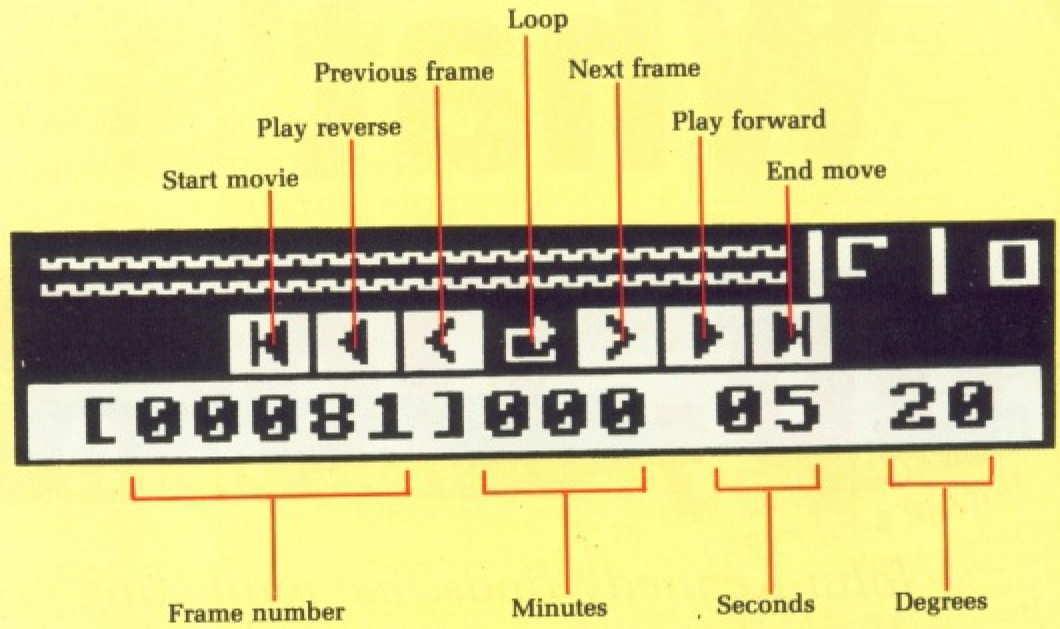
ANIMATIONS are created by first using SetEditor to define all your characters.

Every possible position that the character can be in must be defined. If you are animating a man walking, you must make several drawings, each with his legs in a different position. If you are designing a stationary object, say a lamp post, you need only draw it once.

When the drawings are finished, ScreenEditor must be selected to get down to the business of creating your film.

First you choose the background that your objects will appear in front of. The way in which this background appears can be chosen from a selection of *wipes*, which allow any subsequent backgrounds to appear, not immediately, but in a pre-determined pattern. For example the old background could be replaced by the new background in a series of columns sliding down the screen. There are six such wipes to choose from.

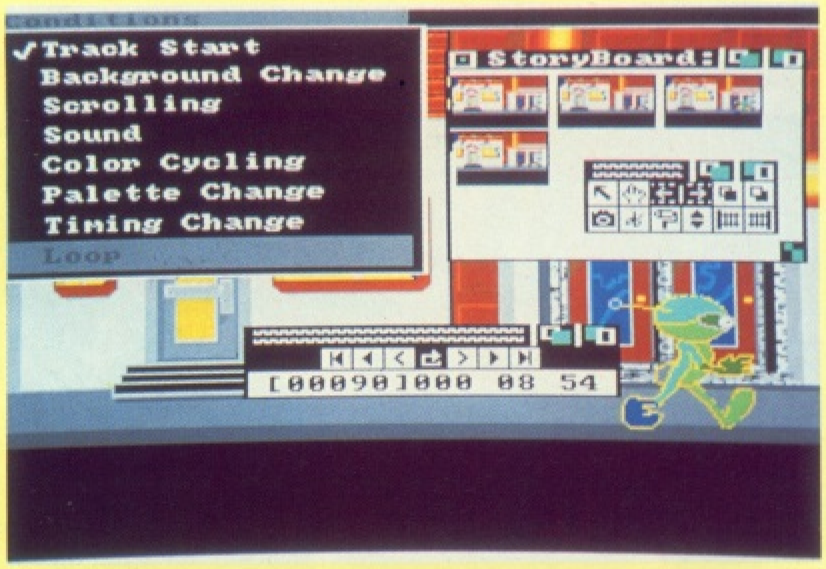
The backgrounds can be scrolled horizontally or vertically. You can specify an acceleration if you want, so the background will start to move slowly and then build up speed. As the manual points out, this mimics real life, where things start slowly, then increase speed. To allow your



The controls are pukka windows



Individual sounds can be tied to individual frames



The Storyboard window can be re-sized to suit

animations to move you must lay down *tracks* for the drawings to follow. After selecting New Track you must choose one of your previously defined sets. When this has been loaded, the pointer is replaced by the first drawing in the set. Clicking the mouse button will fix the face at that position. The face at the pointer is incremented automatically, so the next drawing appears, ready for positioning.

ALL objects remain displayed as you lay them down, making positioning easier. This procedure is repeated, perhaps using a another set and track, until your animation is complete. At any time you can preview the film to see how things are going.

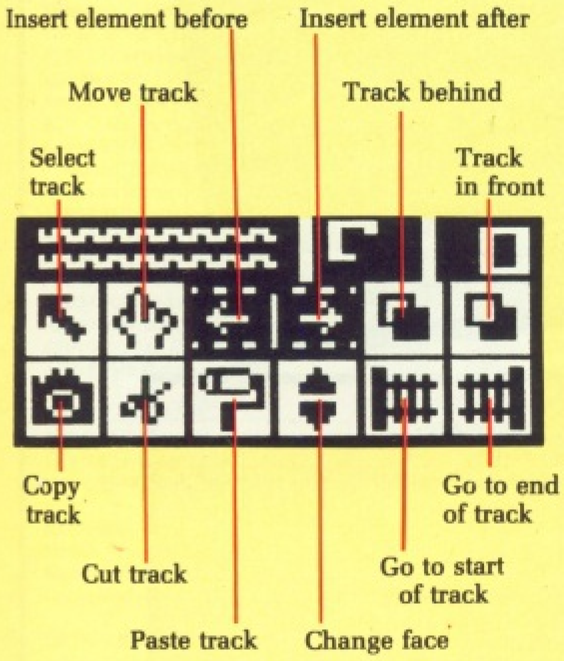
SetDesigner is the part of the program where the hard work in the form of drawing is done. All the features of a standard art package are here – zoom, cut and paste, airbrushes and so on. No *tweening* is done for you by the program, you must redraw every stage of movement yourself.

You can copy details from one drawing to another, which makes things much easier, especially if only a small part of the drawing changes – if the eyes of an object blink, for example. Pictures in IFF format can be loaded and saved, so you can use DPaint or similar if you prefer.

The sound options are impressive and a doddle to use. You select a sound from the menu, choose the pitch using a short section of a piano keyboard and then move through your film until you reach the right moment to play it.

SOUND can be selected anywhere in the stereo image by use of the *pan* slider. A bouncing ball could make a ping sound on the left channel as it hits the left-hand side of the screen and a pong sound on the right channel when it hits the opposite side. Although not wildly useful, it is a nice touch.

Where this section of MovieSetter falls down is with the appalling selection of sounds supplied. Most ►



More memory less restrictions

MEMORY restrictions are important. The program is supposed to work with a standard 512k – the demonstration film supplied was created on such a set-up. This film only lasts for 10 seconds and does nothing amazing, which says it all: You can use the program with no add-on memory, but not to do anything worthwhile.

The length of your film depends on many factors: The number of different objects, the number of sounds used, the number of these, the number of those.

With 1 meg you can use the actual MovieSetter program, a combination of SetEditor, ScreenEditor and MoviePlay. Using MovieSetter with only 512k means being forced to use a monochrome display – not a good thing because all the example art is colour.

All the programs in memory at once means you can have several windows from each program opened at the same time, which simplifies things somewhat.

A Storyboard option is also available with extra memory. This will produce a series of miniature representations of your film with each drawing coming from a specific, user-defined *event*. An event could be each background change or each sound effect.

The first Hold-and-Modify game for the Amiga – 4,096 on-screen colours



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appear to be nothing more than simple clicks and grunts. There was a splendid chance to use the wonderful sounds used in the old Tom and Jerry cartoons – the gasp or scream when Tom's eyes popped out of his head, that sort of thing. Instead we get a "twok" sound made by flicking the sampling microphone with a ruler. Pity.

DOCUMENTATION is thorough and includes a tutorial section to help build up a movie from scratch. The best bit must be a short flickbook cartoon, made up by putting lots of drawings made, presumably, with MovieSetter in the top right-hand corner of every page.

Extra documentation is supplied as a text file in the MovieSetter window and clicking on it will produce streams of information that has been left out of the manual, most of it concerning A500 owners with no extra memory – exactly the people who would want to read the information straightaway, not find it lurking on disc. Bad show, this.

Moviesetter needs both a memory expansion and a drawing program that creates IFF screen files to be used to its fullest. There is no way to create your own backgrounds from within the program, leaving you with the three demo ones to choose from.

Although a disc is supplied containing nothing but example drawings and animations to use, these are all quite limited and none will help create graphics for business presentations.

And when it comes to producing a finished film, the dreadful sound effects and absence of speech bubbles will mean it is an almost completely silent affair.

Although computers have come a long way since the humble ZX81's 64 x 40 monochrome graphics, the prospect of creating your own full colour cartoon is still a long way off. MovieSetter comes close, but not close enough to convince my mother she's watching television. Nice try, though.

REPORT CARD

MovieSetter
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To make anything but a simple cartoon would be out of the question without extra memory.

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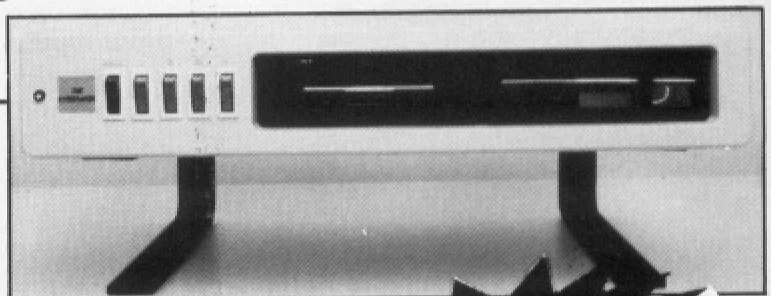
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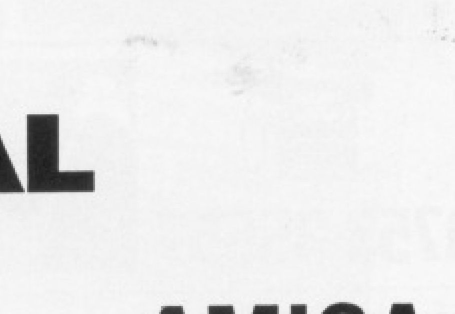
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Ariadne Software's new Opus music composition language can do things that no other program can. Rupert Goodwins asks if it is worth adding to the Chopin Liszt

A knight at the opera



LLOYD WEBBER made it, Bach did it four different ways at once and even Kylie Minogue is rumoured to have heard about it. Music has been big business for a long time. The Amiga, being a musical machine, knows all about it and has some harmonic hardware to generate the stuff. But even sonic silicon needs software to make music. Opus 1, from Ariadne, is that sort of software.

There's lots of Amiga music software – Deluxe Music Construction Set, Sonix, Soundtracker, Soundscape and more. The Amiga, also a graphical machine, encourages its software to be pretty, and since music is normally written as blobs on lines most Amiga music software spends a lot of time picking up blobs and plonking them down on lines. Rather like writing a book with a word processor, it's very easy to make changes, add bits and move stuff around. However, there's more to writing music than words.

A magazine article like this is an almost random collection of words. There are rules of grammar, but if the writer wants to put in a word like gherkin there's no reason why not. It doesn't make the English any worse.

Music is structured; some parts repeat for a fixed number of times, others change as the piece progresses. They have a mathematical relationship between themselves and the time since the piece began. Dropping in a random phrase is certain to make things worse. It's like a computer program.

UNLIKE Instant Music or Deluxe Music Construction Set, Opus isn't a music editor. It's a programming language, or more accurately a music composition

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language, an MCL. To make it produce music, you have to feed it a program, written like any other in a plain text editing program; it then compiles that into a data file which it – or another program – plays. No picking up, no plonking down.

The first step, programming the music, is the interesting part. The Opus language is like another computer language, Forth, an infamous tongue designed to control radio telescopes. It has found a much wider audience among technical and low level programmers, its main features being that it is very powerful – a little Forth can do a lot of work very quickly – and cryptic.

It works by building new commands out of lists of old ones, in the same way that a piece of music is built out of lots of little bits of music. Which is why Opus is like Forth, and why a lot of people will be put off before they even start looking at the package. And that would be a shame.

Perhaps the most arduous part of learning Opus is getting to grips with Reverse Polish Notation. RPN is nothing to do with Polish – it's named after the mathematician who invented it – it is all to do with giving the computer the data it needs before telling it what to do with it. Computers like this; humans, alas, don't. Instead of saying 'Play bongos 100 times', the command is 100 Bongos Play. It isn't difficult to understand, eventually.

Because of RPN, and because of the way commands are built up out of existing ones, it is very difficult to write an Opus program by just feeding in the instructions as you would with Basic. Instead, the program is written as a document in Ed, or Scribble!, or whatever.

Once it all seems likely to work, it is passed to Opus, which compiles it. At this point any errors in syntax, or missing commands, are spotted and the programmer/musician edits the text again.

DEVELOPING the code takes a while. When the program compiles the computer displays the main tracks of music. Tracks are the almost final stage of music generation – lists of notes, instrument changes, dynamic effects (volume, crescendos and so on) and everything else that an individual line of music in a song does.

The tracks are displayed on a stave in traditional format with a few extra bits to let the programmer know what instrument is selected, which bits are repeated and so on.

No editing takes place here – if a note is out of place or a phrase needs changing then it's back to the text editor to modify the program, recompile and review the track. This sounds hard work, and there's no denying that it takes some learning, especially if you are not familiar with developing a compiled program.

The Opus program displays a screen with three main components. At the top is a status window which shows current file details as well as information about the amount of memory being used. Below is the main display window. All of Opus' output appears here – errors from the compiler, listings, the lot. At the bottom is the control window, with a set of buttons which are used to

►

An Opus score

```
(* Bach Chorale Prelude on In Dulci Jubilo *)
(* This sounds nice if you alter the instruments to a variety of
   Midi presets *)
(* instrument definitions first *)


{  Trumpet 0 0 0 }instrument
{  Pipeorgan2 0 0 0 }instrument
Tracks

{  track0
3 K/S 3 4 T/S
trumpet Vfff
  !4 6;A A A !2 7;C# !4 D !2 E !4 F# !2 E !4 R 6;A A A !2 7;C#
  !4 D !2 E !4 F# !2 E !4 R !2 E !4 F# !2 E !4 D ^ C# !8 C# D
  C# 6;B !4 A R R A B B 7;C# 6;B B !2 A !4 B !2 7;C# !4 R E E
  F# !2 E !4 D ^ C# !8 C# D C# 6;B !4 A R R A B B 7;C# 6;B B !2
  A !4 B 7;C# R R !2 6;F# !4 F# !2 G# !4 G# ^ A !8 A B 7;C# D
  !2. E !2 C# !4 C# !2 6;B !4 B ^ A !8-3 A B 7;C# D E F# !4 ^ 6;
  G# !8-3 G# A B 7;C# D# F !4 F# R R !8-3 R A G F# G E D E C#
  !2. ^ D !8-3 D E D C# D 6;B A B G# !2. A !2 R !4 R
}
{  track1
  3 K/S 3 4 T/S
  Trumpet Vmf
  !2. R !4 5;A A A !2 6;C# !4 D !2 E !4 F# !2 E !4 R 5;A A A !2
  6;C# !4 D !2 E !4 F# !2 E !4 R !2 E !4 F# !2 E !4 D ^ C# !8
  C# D C# 4;B !4 A R R A B B !2 6;C# !4 4;B !2 A !4 B !2 6;C#
  !4 R E E F# !2 E !4 D ^ C# !8 C# D C# 4;B !4 A R R A B B !2 6;
  C# !4 5;B !2 A !4 B 6;C# R R R R R !2 5;F# !4 F# !2 G# !4 G#
  ^ A !8 A B 6;C# D !2. E !2 C# !4 C# !2 5;B !4 B !2. ^ A A R
  !4. R !8 F# E D !2. [ A E ] !2 R !4 R
}

{  track2
  3 K/S 3 4 T/S
  Pipeorgan2 Vf
  !8-3 6;A G# F# E F# D C# D 5;B A B A G# A F# E F# D !8 A A A A
  A A !8-3 6;C# E D C# D 5;B A B G# A 6;G# F# E F# D C# D 5;B
  A B A G# A F# E F# D !8 A A A A A A !8-3 6;C# E D C# D 5;B A
  B G# A 6;C# 5;B A B 6;C# D C# D C# E D C# D 5;B A B G# A G#
  F# E F# D !8 E F !8-3 F# B A G# A F# E F# D !8 C# 6;C# !8-3 D
  C# D E D E 5;A 6;E ^ A A B A G# F# G# A B G# F# G# F# E F# D
  !8 C# E 5;A ^ 6;A A G# !8-3 A E G# A B 7;C# D C# D C# E D C#
  D 6;B A B G# A G# F# E F# D !8 E F !8-3 F# B A G# A F# E F#
  D !8 C# 5;C# !8-3 D C# D E D E 4;A 5;E ^ A A B A G# F# G# A
  B G# F# G# F# E F# D C# D E F# E F# G# F# G# ^ A# A# A# !4-3
  B !8-3 6;C# D E C# !4-3 D !8-3 5;B 6;E F# D C# D 5;B !8 6;C#
  5;C# F# G# A B !8-3 B 6;B A G# A F# !4 E !8-3 E 7;C# 6;B A B
  G# F# G# E D D 5;B 6;E F# D C# D 5;B !8 6;E 5;F F# G# !4 A D
  C# G# F# !8-3 R A G F# G E !4 F# !8 R [ 6;G 5;G ] [ 6;F# 5;F#
  ] [ 6;E 5;E ] !2. ^ [ 6;F# 5;F# ] !8 [ 6;F# 5;F# ] [ 6;F# 5;
  F# ] [ 6;E 5;E ] [ F# 6;D 5;D ] [ E 6;C# 5;C# ] [ D B 4;B ]
  !2. ^ [ 5;E A 6;C# 5;C# ] !8 [ E A 6;C# 5;C# ] !2 R !8 R
}

{  track3
  3 K/S 3 4 T/S
  PipeOrgan2 Vmf
  !2. R !8-3 4;A G# F# E F# D C# D 3;B A 4;B A G# A F# E F# D !8
  A A A A A A !8-3 5;C# E D C# D 4;B A B G# A G# F# E F# D C#
  D 3;B A 4;B A G# A F# E F# D !8 A A A A A A !8-3 5;C# E D C#
  D 4;B A B G# A 5;C# 4;B A B 5;C# D C# D 4;A 5;E D C# D 4;B A
  B G# A G# F# E F# D !8 E F !8-3 F# B A G# A F# E F# D !8 C#
  C# !8-3 D C# D E D E 3;A 4;E ^ A A B A G# F# G# A B G# F# G#
  F# E F# D !8 C# E 3;A ^ 4;A A G# !8-3 A E G# A B 5;C# D C# D
  4;A 5;E D C# D 4;B A B G# A G# F# E F# D !8 E F !8-3 F# B A
  G# A F# E F# D !8 C# C# !8-3 D C# D E D E 3;A 4;E ^ A A B A
  G# F# G# A B G# F# G# F# E F# D# E F# E D E C# 3;B 4;C# 3;A E
  4;E D C# D 3;B A B G# F# 4;F# E D E C# 3;B 4;C# 3;A G# 4;G#
  F# E F# D C# D 3;B !4 A 4;E A !8-3 A B A G# A F# !4 G# !8-3
  G# A G# F# G# F !4 F# !8-3 F# G# F# F F# D# !8 E C# !8-3 3;F#
  A G F# G E D E C# !2. ^ D !8-3 D E D C# D 2;B A B G# !2. [ 3;
  A 2;A ] ^ [ 3;A 2;A ] !8 [ 3;A 2;A ] !2 R !8 R
}
110 tempo
```

control the compiler.

To start with you have to set up input and output files before Opus will even consider compiling a program. The buttons bring up a standard list of files from directories called Text and SMUS, the Amiga standard music file format. Normally you pick the program you want to compile as input from the list in the normal way. The same mechanism is used to choose the output file.

WORKING backwards has obviously become ingrained in the programmer's soul. Choosing an output file would normally be simple, either automatically generated from the input filename or just typed in. With Opus the output filename stays until explicitly changed. If you pick a new input file and forget to change the output the old output file will be lost. This happened to me, embarrassingly more than once.

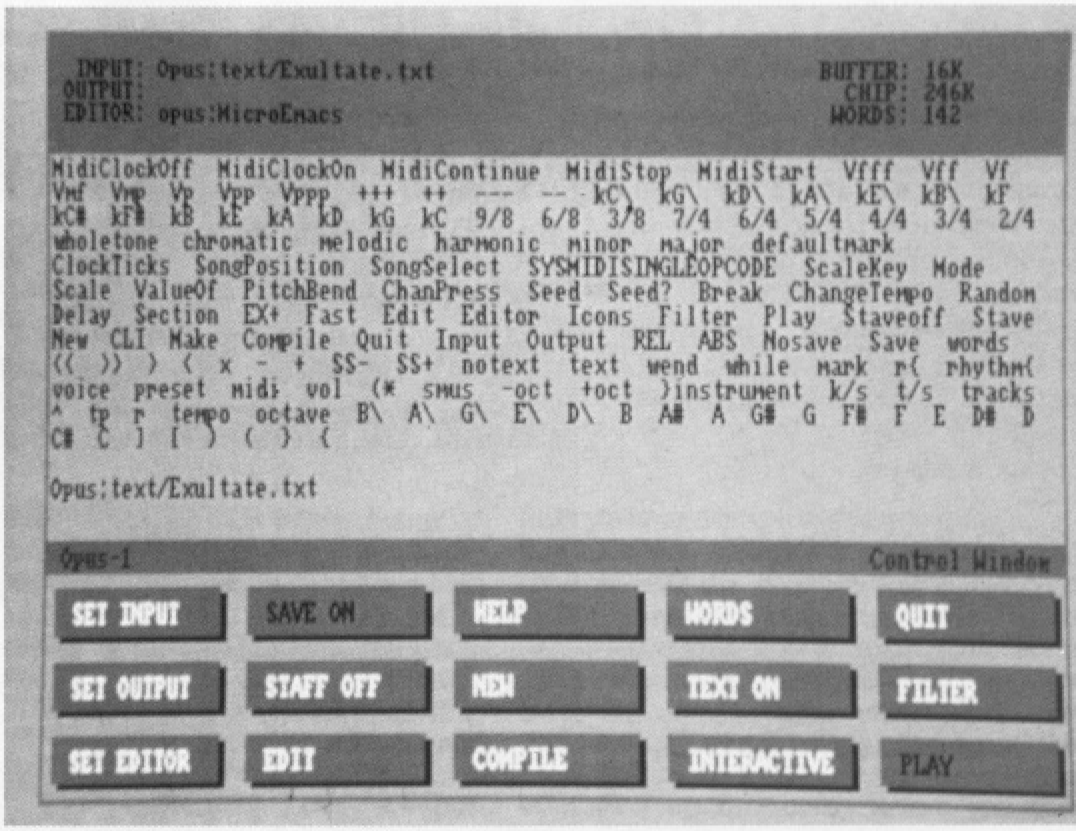
There are other oddities on the control panel. Some of the buttons toggle between two states; save off switches to save on, and this controls whether to automatically save the output file once it's compiled. However, when automatic save is on the button shows save off and vice versa.

Likewise the compiler can display the part of the program it's currently dealing with; there's a button marked text on or text off to control this. When text is displayed, the button is marked text off. There is a kind of logic in this, but it's unlike any other Amiga program that I've seen.

Other buttons include Words, which shows all the commands Opus knows about, Compile, Edit and Play, which do the obvious, Filter which turns the Amiga's internal sound filtering (and the power LED) on and off and Quit, which finishes Opus and returns to the Workbench.

The filter gets rid of some of the high frequency noise from the Amiga's audio output. With it on music sounds muffled but clean; when the filter's off, the music sounds much brighter but with some odd noises thrown in. You might have noticed that some games turn the power LED off. This isn't for the fun of it – the music sound better. Amiga 1000 owners do not have this feature.

Experienced programmers and mouse haters might prefer the interactive option. A button switches



The compiler is a proper intuition program

off the control window and leaves you at a prompt in the Interactive window. Here Opus commands can be typed in directly. It's a good idea to leave this until at least one program has been written and got working with the help of the control window. The Help button produces several screenfuls of online help, as might be expected, but it's not terribly useful.

Once a program is compiled and saved, either the main program's player – which has a dandy little display of notes playing for all four channels – or the stand-alone, displayless but very fast player can be used to turn all that hard work into beautiful melodies.

INITIALLY the programming language is incomprehensible, but a little inspection reveals the logic behind it. The first items in a program are usually the instrument definitions, in the form {**cello 0 0 0** }**instrument**.

The cello is the name of the IFF instrument which Opus expects to find in the directory assigned to Instruments. The three zeros are part of the smus definition and are used if a link to Midi is needed instead of a sampled instrument or for other special purposes. The final "instrument" tells Opus to take the data and load it as an instrument – RPN, remember? In a Basicish language, the equivalent command would be **instrument=cello,0,0,0**

Then come the tracks. The word TRACKS is used to tell the computer that the following words should be compiled into a list, not just analysed and left till later. The lists of notes are kept within curly braces { and }, and begin with a word that will be used later to refer to the whole list. So the list { **nasty 4 4 t/s cello !4 4;a b c a/ f# a** } would sound awful (believe me), but could be included in a song later by something like **100 (nasty)** which would play nasty 100 times.

The various parts of the list are 4 4 t/s – set the time signature to 4/4, cello – use the cello instrument, !4 – use crochets, 4; – use octave 4, a b c a/ f# a – play the notes a, b, c, a flat, f sharp and a. If you don't know what a time signature is, and think crotchets are a kind of snack, then the chances are that Opus is not for you.

Of course, if you don't like to use 4 4 t/s to set the time signature you can always define a new word to use in its place, like { **common_time 4 4 t/s** }. But you have to define words before you can use them.

Although Opus generates standard IFF smus files, which can then be played on any music player program, it has a file structure of its own which caters for the many extra features that Opus supports but that aren't in the smus definition. For example, if you want a bit of music repeated 1,000 times then the smus file has to have the bit of music repeated 1,000 times. The Opus file definition – OPX1 – ▶

◄

just has the instruction to repeat 1,000 times in front of the bit of music.

This can result in some extraordinary savings in file size, and since each bit of music can have its own loops inside it is possible to produce a piece that will fit on a floppy but will play for longer than the Universe will survive. As the manual says, that's a sobering thought...

Other tricks in the Opus repertoire include repeating a loop until another bit of the music is finished, sending pitchbend and aftertouch information to the Midi channels in order to slide notes, adding vibrato and other effects to a note after it's been struck and randomly choosing between options. The word Break will wind down a complex series of loops in a controlled fashion, useful for those into weird, polyrhythmic music.

All the things that aren't capable of being expressed in normal smus format are included in a small subset of extensions. The idea is that the format is 99 per cent smus and existing players can be modified quickly to cope with the flood of OPX1 format music which is, Ariadne hopes, about to flood the market.

Opus-1 needs at least a megabyte to work with. It comes with Opus- 512, which foregoes some of the posh features of Opus-1 (online help, control panel) to give the unexpanded A500 a bite of the cherry, but since the program is properly written and can merrily multitask, people with more ram get more fun.

There are a couple of extra programs in the package, one to capture Midi information from a keyboard and turn it into an Opus source file – so it can be edited, transposed, cleaned up, and so on – and one called Performance which is much more interesting. It plays music, and lets you play along on a Midi keyboard.

Once you're happy with what you've got, you can mix it into the main track and play another line. It's multitracking; limited but – Ariadne dangerously admits in the documentation – a pointer to what's going to happen to future Opera.

GRANTED Opus is a programming language. But does it sound any good? Since it plays sampled sounds, in theory it should sound no better and no worse than the rest. But in terms of what it can do with the samples, it is orders of magnitude more flexible than the competition.

People with a serious fondness for producing music will be able to use Opus to wipe out the rest. But the prospective Opus owner must know at least the basics of music theory, be prepared to program, and to brave the eccentricities of the Ariadne user interface philosophy, which is only slightly less impenetrable than Zen Buddhism.

I can see this program justifying the purchase of an Amiga for a music laboratory in a university or polytechnic. Likewise, anyone who knows their chromatics from their arpeggios and is fond of Philip Glass shouldn't hesitate before taking the plunge. But the new muso, or those who have problems programming their video, should stick to the other, graphic-based programs. In fact, one of those would make a good companion to Opus.

Wishlist? Well, it would be nice, given all the support that exists for experimental music in the package, not to be limited to Western scales but to include Eastern and microtonal options (I only want the world). And there are plenty of rough edges which put Opus in a needlessly bad light against other, swisher packages. But Opus does things with music that other programs can't.

My neighbours are going to hate Ariadne.

REPORT CARD

OPUS-1
Ariadne Software
£99.95

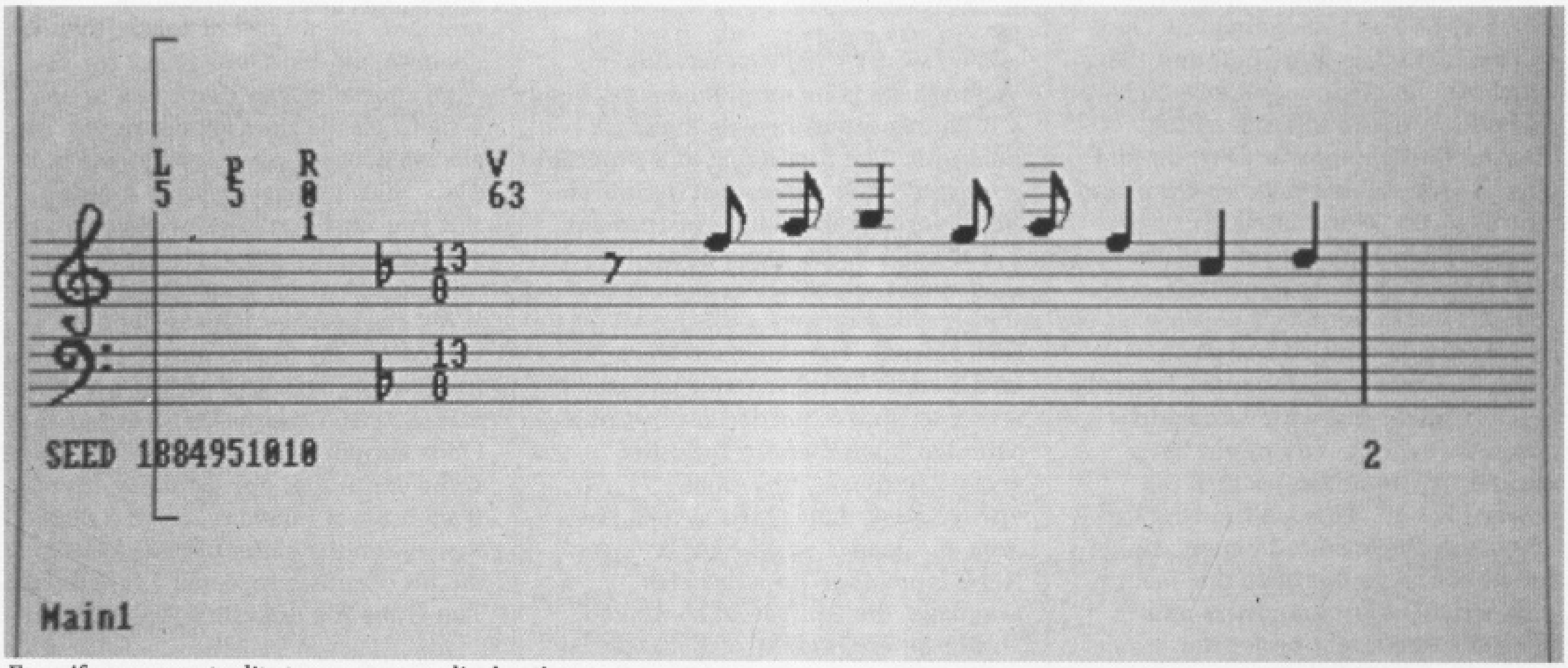
EASE OF USE...........
This is a programming language. No compiler is going to be easy to use if it is to be powerful and flexible.

SPEED......................
Does not hog the processor while you are multi-tasking. This is a properly written suite of Amiga programs.

VALUE ....
Opus is pretty expensive for a music program – good value for a language.

OVERALL 78%

There are some things that no other music program will do. It's not for the novice muso or programmer but is an incredible musical tool.



Even if you cannot edit staves you can display them



FUNKY

HAVE you read the explanation of DEF FN in the AmigaBasic manual? Bit heavy, isn't it? And it doesn't even skim the surface. A novice to Basic would wisely pass on to the next keyword, yet functions are really rather simple. Without resorting to counting, I would guess that over half the keywords in AmigaBasic are functions.

You can spot them a mile off because the keyword is always preceded by an equals sign. For example,

```
(a) what$=INKEY$
(b) guess=RND
(c) value=PEEK(100)
```

Another thing all functions have in common is that they return a value of some type. But be it floating point, integer or string, a function will only return a single value.

In example (a) the function INKEY$ is called and the string value returned from the function is assigned to the variable *what$*. In example (b) the function RND is called and the variable *guess* is given the floating point value which returns. In example (c) the function PEEK is called, which introduces us to an important concept of functions, the parameter.

Most functions need to be supplied with at least one parameter, and it is always given in round brackets directly following the function name. In this case, the function of PEEK is to look at a memory location and return the one byte integer value it finds there. Obviously we need to tell it where to look, and that is what the (100) in example (c) is, the memory address we want PEEK to investigate.

So let's define ourselves a simple little function to do something mildly useful – to pick a random whole number between zero and 10:

```
DEF FNrandom = CINT(RND*10)
```

The name after FN, in this case *random*, is supplied by your good self

Y FUNCTIONS

Jeff Walker delves deeper into AmigaBasic

and follows the same rules as for variable names: It must start with a letter, can include numbers and fullstops, can be up to 40 characters in length, mustn't be an AmigaBasic keyword and can be followed by one of five symbols – %, &, !, #, $ – to signify which type of function it is.

Once our function has been defined we can use it almost as if it is a new AmigaBasic keyword. Listing I is a simplified view of it. In practice you would be assigning the value returned by *FNrandom* to a variable. Something like:

```
number = FNrandom
```

Right. Before we go any further we must learn a very important rule about using defined functions, which is that the function must have been defined before calling it for the first time.

The best way to do this is to put all your DEF FN statements in one initialising subroutine, like *Initialise* in Listing I, and make the first line of your program GOSUB to that subroutine. If you always do it this way you will never have problems – typing mistakes apart – with

```
Start:
  GOSUB Initialise.variables
  GOSUB Print.random.numbers
  END

Print.random.numbers:
  PRINT FNrandom
  FOR delay=1 TO 1ØØ:NEXT
  GOTO Print.random.numbers
  RETURN

Initialise.variables:
  DEF FNrandom = CINT(RND*1fl)
  RETURN
```

Listing I

Undefined user function error messages.

Oh yes, and unless you are really pushed for memory – which isn't at all difficult with barely 25k to play with (curse you, MicroSoft) – never redefine a function to do something else. It creates confusion and bugs.

There is no restriction on the number of functions you can define, so if you need a function to do a different job, define a new one with a fresh name in your initialising subroutine instead of re-using an old function name that you know has no further use in your program.

OK. Getting back to the programming, *FNrandom* would be more useful if it was a little flexible in the range department. In other words, instead of letting it pick a number from zero to 10, wouldn't it be better if the top of the range was supplied as a parameter? Of course it would. That way we can use *FNrandom* in any program that needs random whole numbers between zero and anything. Take a look at this:

```
DEF FNrandom(x) = CINT(RND*x)
```

The *(x)* after *FNrandom* means we will have to supply a parameter when we call the function. The actual variable name *x* is arbitrary. By that I mean it could be *a, b, HumptyDumpty,* or whatever.

WHATEVER variable name you use in brackets on the left-hand side of the definition, the same variable name should appear somewhere on the right-hand side because it will be used temporarily to hold the supplied parameter while the function works on it. In this case the variable appears on the right-hand side in the calculation *RND*x*.

Whatever you call your variable, its name and value will always be local to the function it is defined in. That means that if you have another variable of the same name elsewhere in the program it will be unaffected by the function. The simple example in Listing II illustrates this local variable concept better than a thousand words.

If you run the program you'll see that the value of *x*, set up in the line labelled *ValueX*, remains constant at 999 even though we use *x* in the line labelled *Define* as the variable to hold the parameter passed to the function,

```
ValueX: x=999
        GOSUB PrintX
Define: DEF FNrandom(x) = CINT(RND*x)
        GOSUB PrintX
Choose: picked = FNrandom(5Ø)
        PRINT "PICKED =";picked
        GOSUB PrintX
        END

PrintX: PRINT "X =";x:RETURN
```

Listing II

which is called in the line labelled *Choose.*

If you study the line labelled *Choose* you'll see how a parameter is passed to the function. In this case the parameter is the number 50, but it could just as well be a number variable of any name – including *x* if you want to be literal about it. It could even be a long calculation like:

```
picked = FNrandom(guess*4+2*total/3)
```

As long as what is between the outermost brackets evaluates to a legal return value for the function, the calculation can be as weird or complicated as you like. For instance, you could use a function as a parameter:

```
picked = FNrandom(FNrandom(1ØØ))
```

which would be perfectly legal. A line like that would first pick a

▶

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random number between zero and 100 – say 67 – then pick a random number between zero and 67, then pass that value back to the variable *picked*.

REMEMBER, however, that defined functions can't access variables in the program proper, they can only work on variables you've passed to the function as parameters.

And you don't have to stop at single parameters, you can have as many as you like. We could extend the portability of *FNrandom* further so that both the top and bottom of the range are supplied as parameters.

In Listing III you supply the number range as the lower and upper limit inclusive, separated by a comma. The example picks 15 random numbers between and including 100 to 200. You've got to admit that:

```
picked = FNrandom(100,200)
```

is far more readable than:

```
picked = CINT(RND*(200-100))+100
```

SO far we've only looked at functions that return numbers, but we can also define functions to return strings. The principle is exactly the same, except that you should suffix the function name with a dollar sign. Thus, if you defined a function *FNlf$* as:

```
DEF FNlf$(x) = STRING$(x,CHR$(10))
```

and then executed a line like:

```
PRINT FNlf$(25);
```

you would get 25 linefeeds printed, scrolling whatever text was on the screen up through the top of the window, giving you a slow but fancy CLS. The number in brackets after *FNlf$* is the number of linefeeds that



will be printed.

Again, that's a simplified example, but you can do clever things like defining a function to split someone's forename from their surname and capitalise the first letter of each. Which is what Listing IV does.

TAKE special note of the use of *FNfname$* and *FNlname$* as parameters for *FNcapit$* in the final two lines of that listing. I'll leave you to wade through the logic of the string slicing in the DEF FN statements on your own. Paracetamol will help, although you should be experts on strings after last month's article.

Although the function itself is of a certain type, the parameters you pass can be of a different type, or even of mixed types. As an example, here's a function that will pad out a string with a programmer-defined character to a programmer-defined length:

```
DEF FNpadleft$(text$,char$,size) = S
TRING$(size-LEN(text$),char$)+text$
```

Watch the wrap. Don't press Return after = *S*, type the whole thing into the List window as one line. Notice that the function itself, *FNpadleft$*, is a string function, but the parameters are of both string (*text$, char$*) and number (*size*) type. You can test it out by adding another line:

```
PRINT FNpadleft$("Fred","*",10)
```

which should print six stars followed by the word Fred.

FINALLY this month, we've seen how defined functions can use themselves or other functions as parameters, and although you can also use other defined functions in a function definition – which is totally mind-blowing and something you ought to experiment with because it's better than a cold shower in the morning – you can't use recursion with functions. In other words, a defined function can't call itself from within a function definition.

Confused? You will be. Try this:

```
DEF FNhalf(x) = FNhalf(x)
PRINT FNhalf(100)
```

OK, logic tells you this is wrong anyway; it is merely a quick example of what happens. The program stops with an *Out of memory* error message. What's amazing is that the error message is correct. Yes, all 25k of AmigaBasic user memory has been used up by this tiny program. How? Well, it's due to something called stack overflow, which is another subject and a good way to end an article on defined functions. Byeee.

```
Start:        RANDOMIZE TIMER        ' Set the seed for RND.
              GOSUB Initialise       ' Define the function.
              FOR loop=1 TO 15       ' Do the next bit 15 times.
                GOSUB Pick.number    ' Pick a number,
                GOSUB Show.picked    ' print it,
              NEXT loop              ' if loop<16 do it again.
              END                    ' Otherwise finish.

Pick.number:  picked=FNrandom(100,200):RETURN
Show.picked:  PRINT picked;:RETURN
Initialise:   DEF FNrandom(lo,hi)=CINT(RND*(hi-lo))+lo:RETURN
```

Listing III

```
DEF FNfname$(x$) = LEFT$(x$,1)+MID$(x$,2,INSTR(x$," ")-2)
DEF FNlname$(x$) = RIGHT$(x$,LEN(x$)-INSTR(x$," "))
DEF FNcapit$(x$) = UCASE$(LEFT$(x$,1))+RIGHT$(x$,LEN(x$)-1)

INPUT "Enter forename lastname: ",fullname$:PRINT

PRINT "Forename = ";FNcapit$(FNfname$(fullname$))
PRINT "Lastname = ";FNcapit$(FNlname$(fullname$))
```

Listing IV

FREQUENT mentions of exotic fruits in computer articles is prohibited by the EC directive "Importation of fruiting bodies and plant components by reference into European 68000 machine code descriptive tracts (part 3)". However, the use of small mammals, and birds no matter how exotic, is still allowable, pending a decision by the European Court. So we'll have no more kiwifruit, but we can settle for the flighty one.

Last time, the idea of subroutines was spotted on the sonar. Subroutines are chunks of code that have a specific purpose, almost little programs in their own right. These are very useful for several reasons. First, and most importantly, they prevent that curse of the coding classes: Finger Wear And Brain Fade.

FWABF is well known to the medical profession; the sufferer has his digits permanently curved in the typing position and his brain locked in an endless loop considering his program complexity. It's nasty, but avoidable.

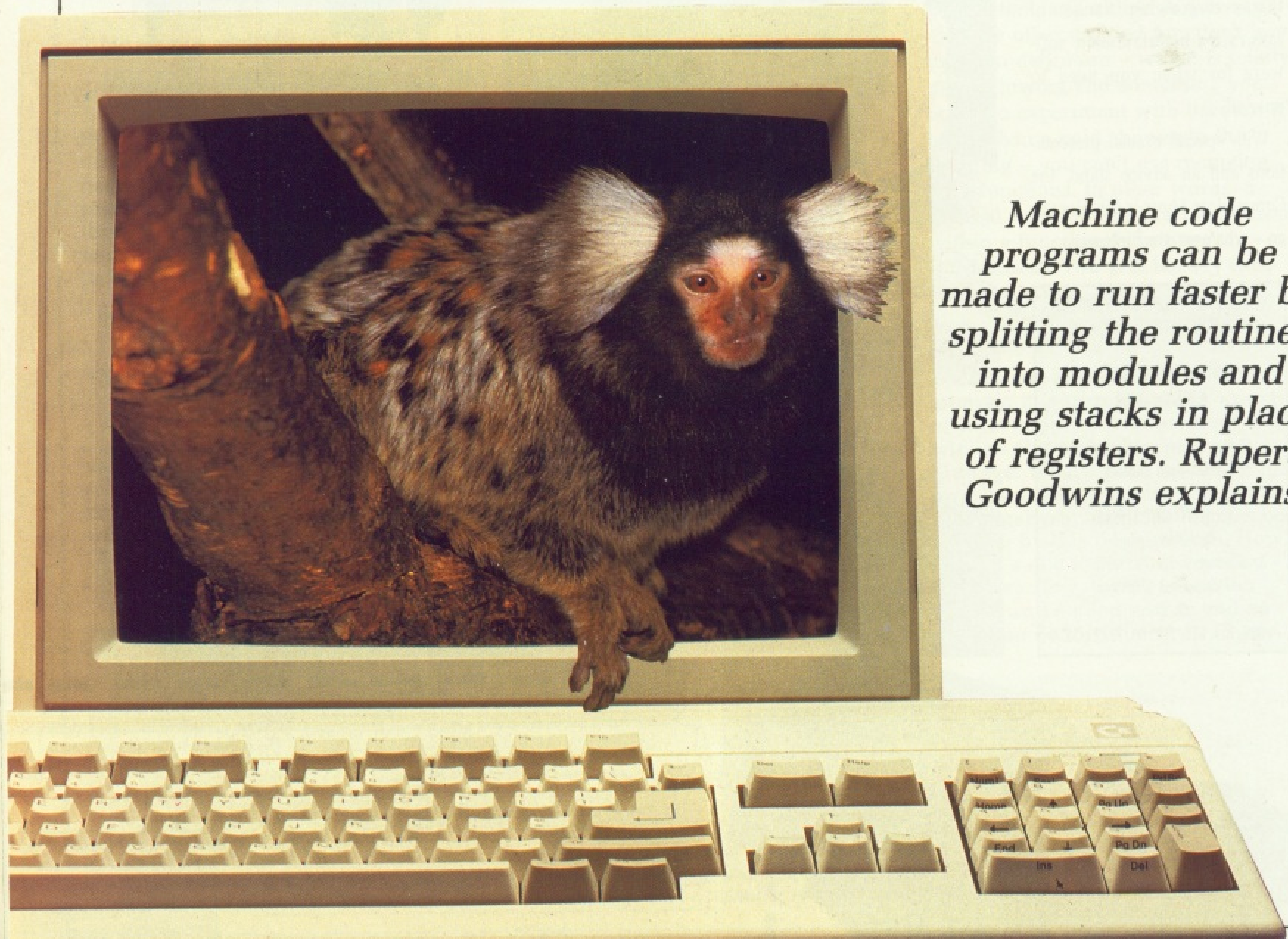
Say that you want to get your Amiga to squeak like a coypu at various times during a program – when a user types in the wrong thing, for example, or when your animated aardvark collides with a motionless marmoset.

You could work out the instructions to make the noise and put them in the program at every point they're required, but it's far simpler to make the squeak a subroutine and call it by a JSR (Jump to Subroutine) each time.

Not only does this save typing, it makes the code smaller. The only disadvantage is that it's slightly slower – the processor has to execute a JSR and an RTS (ReTurn from Subroutine) each time which wouldn't otherwise be there. But that's only two more instructions, and it's very rare that speed is so important that subroutines have to be abandoned in favour of repeating the instructions. That particular trick is called inline code, by the way.

There are more advantages. First, if you want to change anything you only have to look in one place; anything which means you have to go through mountains of listings usually mean you'll miss things and make mistakes. Secondly it's easier to catch bugs, for the same reason. It also makes it easier to have one squeak routine that can be used in many programs – the generation of sets of

Stacks and subr



Machine code programs can be made to run faster by splitting the routines into modules and using stacks in place of registers. Rupert Goodwins explains

useful bits that can be plugged into new programming projects is called building up a library, and it is something all professional programmers do. Helps prevent FWABF.

Lastly, it makes a program easier to understand, since a JSR coypu–calling in the code is self-explanatory. The trick lies in deciding when and where to employ subroutines; if you're often copying strings around memory it's worth having the string copy code as a subroutine, but if you only do it once then the overhead might not be worth it.

Subroutines can – and often do – call other subroutines; that coypu code would most likely set up an area of memory to sound like a large, water-living rodent and then call another subroutine that just took an area of memory and made a noise with it.

broutines

The second subroutine would also be used by others, like the one that said "Game Over". Again, the right choice of subroutines makes the programming easier, and is a large part of the process of software design.

There are problems with subroutines; they make nests beneath the floorboards and steal cheese. Also, they – like any other useful bit of code – have to use registers to do their thing. But at the point in the code where you call a subroutine, you might be using the same registers for something else.

Since having to make sure that you knew what subroutines used what register before you could use them would promote FWABF, it's a good idea to save the contents of whatever registers will be used in a subroutine at the beginning, and restore them later. And the 68K, like most other microprocessors, has just the place for them – the stack.

PROGRAMMERS have a love/hate relationship with their stacks. They're useful, convenient but tend to take on a life of their own and, unless controlled, cause interesting side effects. A stack is an area of memory which is used for storing temporary data, but since it's the sort of data which is very important to the processor – register contents, addresses for subroutines to return to, and so on – there are special mechanisms which provide fast access to it.

Stacks on the 68000 are more complex than with most other processors, since there are various ways to use the things.

The stack's address is normally pointed to by a special register called the stack pointer – if you wanted imagination, you should have gone into basketweaving. The 68000 doesn't have a register that's called the stack pointer; instead it uses the address register A7 to do its dirty work.

There are actually two A7s within the dark recesses of the 68k – one is switched in when the processor is in user mode, and the other when it's in supervisor mode. This last mode is more powerful, and tends to be reserved for use by the operating system which has to control what programs get what memory.

ONE effect of this is to give the supervisor mode a separate stack. Another is to prevent A7 from being used as just another register – if you do this, it's the equivalent of wrapping your chips in the roadmap.

Things are written to the stack in three ways. The first is done automatically by the processor when it comes across a subroutine call. A JSR, makes it subtract eight bytes (a longword) from A7, since that's the amount of memory needed to store an address.

It takes the address of the instruction that follows it and sticks it in the area of memory pointed to by A7. Then it jumps to the new address specified by the JSR. A7 now points to spare memory, which the subroutine can use if it wants.

When the processor comes across the RTS instruction later it adds eight bytes to A7 and reads in the data at that address. This data was the address following the JSR instruction, so the processor loads it into the program counter and carries on.

Since it doesn't care what happens to the data on the stack now, the program can reuse the stack memory. But, while the processor was exeouting the subroutine it did care about keeping the return address safe, so by subtracting a longword from A7 it stopped anything else from overwriting it.

This only works, of course, because everything follows the same rules. Put something on the stack, subtract the length of whatever it is from A7. Take something off, then add the length to A7. As the stack gets used, it grows down through memory, as information is removed, it shrinks upwards again.

The second way of putting stuff on the stack is by using the normal MOVE instruction. If a subroutine wants to use registers D0, D1 and A4, it can save the old contents by the following:

```
MOVE.L D0,-(A7)
MOVE.L D1,-(A7)
MOVE.L A4,-(A7)
```

Here the subroutine does evil things to the registers:

```
MOVE.L (A7)+,A4
MOVE.L (A7)+,D1
MOVE.L (A7)+,D0
RTS
```

Note the use of those awfully useful increment and decrement fixes to make the saving and loading of registers nice and short. Also note the obvious – once you know about it – fact that stack items are removed in the opposite order they are put on. It might seem natural to remove D0,D1 and A4 from the stack in that order, but it would result in the original value of D0 ending up in A4, and vice versa.

It might be becoming obvious why the stack is a place for introducing subtle bugs – the program that called the subroutine might not check A4 or D0 for a while after it calls the subroutine, so the real cause of the error would be lost in the mists of CPU time.

Other things that can go wrong with the stack include removing less than you put on, or more – it really doesn't matter which. Either way, when the final RTS turns up, the processor will remove the incorrect return address from the stack and blithely do a BDB, or Branch Dim Beyond. You the programmer will observe a machine apparently ▶

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possessed by a demon; experience is the only way of preventing this.

There is a quick way of putting whole scads of registers on the stack, and pulling them off again afterwards. This involves a new variant of the MOVE instruction – MOVEM, or Move Multiple. So, the instruction:

```
MOVEM.L D0-D2/A0,-(A7)
```

will stick D0, D2 and A0 on to the stack and adjust A7 accordingly. At the end:

```
MOVEM.L (A7)+,D0-D2/A0
```

will put everything back again. This is a bit slower than one ordinary MOVE instruction, but quicker than about three. So, if you have to keep three or more registers safe and sound across a subroutine, MOVEM is your best bet.

Using the stack in this way is quite slow in relation to other machine code instructions, and whereas it's safest just to save registers, significant increases in speed can be had by being very selective about what gets saved and what gets sacrificed.

Obviously, if a program's got a fixed number in A5 it's quicker just to reload it after a subroutine than to expect the subroutine to carefully store it on the stack and replace it afterwards.

But maybe you want to use the same subroutine elsewhere where A5 has more important data; again, this comes down to designing the program properly in the first place and balancing speed against efficiency and ease of programming.

The third way of using the stack is a little odd, and involves the PEA instruction. Luckily there is a specific exemption for this in the EC directive, otherwise it would have to be called the GERBIL instruction. PEA stands for (no jokes about standing for a PEA, please) Push Effective Address.

Most processors – but not the 68k – have special instructions for saving stuff on the stack called PUSH and POP. Since the 68k can use its ordinary MOVEs for stack operations, the only place where PUSHing comes in is with this. PEA takes an address and puts it on the stack. It's similar to what the processor does with JSR but you get to define the address how you like and the processor doesn't attempt to jump anywhere afterwards.

PEA isn't overworked: It can be used to set up false return addresses from subroutines or to put parameters ▶

```
      opt l-,c+,d+

      incdir ":include/"

      include exec/exec_lib.i
      include libraries/dos_lib.i
      include libraries/dos.i

start   move.l #dosname,a1
      moveq   #0,d0
      CALLEXEC OpenLibrary  ; get access to the OS
      tst.l   d0
      beq stop_now        ; stop if we can't

      move.l  d0,_DOSBase ;save pointer

 * now find our output handle

      CALLDOS Output
      move.l  d0,output_handle ; save output handle

 * a series of subroutine calls hide the complexities of
 * loading registers and calling DOS from the programmer
 * who just has to move single lines of machine code about
 * to change the output of the program

      bsr start_message
      bsr marmoset
      bsr squirrel
      bsr mole_rat
      bsr magenta_faced_lemur
      bsr end_message

 * finished so close DOS library

      move.l  _DOSBase,a1
      CALLEXEC CloseLibrary

stop_now
      rts           ; and finish

 * Subroutine to print a message
 * Needs d2 -> string, d3 = string length

scared:       ; we all live in a yellow subroutine...

      move.l output_handle,d1 ; set up output handle
      CALLDOS Write
      rts

 * Subroutines to select a message to print
start_message:
      move.l  #start_text,d2
      move.l  #start_len,d3
      bra do_output
marmoset:
      move.l  #marmoset_text,d2
      move.l  #marmoset_len,d3
      bra do_output
squirrel:
      move.l  #squirrel_text,d2
      move.l  #squirrel_len,d3
      bra do_output
mole_rat:
      move.l  #mole_rat_text,d2
      move.l  #mole_rat_len,d3
      bra do_output
magenta_faced_lemur:
      move.l  #magenta_text,d2
      move.l  #magenta_len,d3
      bra do_output
end_message
      move.l  #end_text,d2
      move.l  #end_text_len,d3
do_output:
      bsr scared
      rts

start_text  dc.b   "In my shoebox, I've got "
start_len   equ *-start_text
marmoset_text dc.b  "a manic marmoset, ",10
marmoset_len equ *-marmoset_text
squirrel_text dc.b  "a sullen squirrel, "
squirrel_len equ *-squirrel_text
mole_rat_text dc.b  "a morose mole rat, "
mole_rat_len equ *-mole_rat_text
magenta_text dc.b   "a blushing magenta-faced lemur, "
magenta_len equ *-magenta_text
end_text dc.b "and a happy goldfish.",10
end_text_len equ *-end_text

_DOSBase        dc.l    0   space for pointer
output_handle   dc.l    0   space for handle

dosname DOSNAME

      even
```

Using subroutines to write text to the screen

◄

on the stack before a RTS.

Passing parameters on the stack is an advanced technique. It's very useful when interfacing machine code routines to high level languages like C or Basic, and also for any situation where you want to pass information to a subroutine but there aren't enough spare registers.

It works by putting all the data on the stack before doing the JSR. The subroutine knows that there is a longword of address data on the stack and that after that it can find its data, so it loads the value of A7 into a spare address register, adds eight (for example – if it's saved some registers on the stack already it might add more) and can then get at the data by using this new address register.

At the end it can put results back in the same place – providing there's enough room, if not the calling program has to leave some extra space on the stack before doing the JSR – before restoring the old value of the address register that it used and doing an RTS.

The reason for going to all this bother is that, since the data is kept on the stack, it doesn't take up any permanent place in memory and it can be reused without any FWABF. Also since the stack grows and keeps whatever's on it safe and sound, the routine can call itself without overwriting anything important. This last is called recursion, and sounds completely bonkers – why would any routine want to call itself?

THERE are lots of reasons. Imagine that every second you want to do 10 things. Every second you call a routine that does these 10 things. One might be "if the giraffe's fallen over, squeak like a coypu" and it might take longer than a second to complete.

So you're deep inside your "do 10 things" routine when another second comes up and the routine is called again. If the thing's not recursive, all the information needed to complete the first call will be overwritten by the second call, and when the coypu routine finishes the chances are the computer will crash.

But if everything's safe on the stack, all will unwind safely. The only proviso is that there's enough room between the stack and whatever's next in memory...

Finally, always comment your subroutines with special clarity. It's a good idea to put at the beginning of each subroutine a comment noting the registers it changes and those it saves, the amount of stack it needs, what the routine does and any other special things it needs.

This makes it easier to reuse the subroutine later, as well as making your programs even easier to read. It's a hassle, but not as much as the onset of FWABF at three in the morning.

This month's program uses subroutines to display different animal names.

By shuffling the order of the various subroutine calls, the order of the names change, too – much easier than moving large blocks of data around. Although it's not particularly fruitful (whoops, sorry EC).

Making movies

Sam Littlewood gets things going in the penultimate part of his animation series



COMPUTER animation is as fashionable as Ozzie soaps, although it has been around almost as long as jeans which button up. Nothing gets an advertising agency reaching for the chequebook faster than the thought of the client's name flying down the Grand Canyon in six foot silver letters.

Animation falls into two broad styles. The first is to describe the motion of fixed objects over time. The description is often in terms of a *path*. This describes position, pitch, roll and yaw, and scale. A refinement of this system is to allow paths to be attached to other paths – giving submotions – such as a jaw moving while a head is turning. Some systems allow the special objects in an animation to fly along paths, such as the lights and camera.

The second category is to describe the world at two separate points in time, and the computer then works out the intermediate positions. An object can be changed smoothly from a cube to a sphere. It could explode by defining the normal object at the start of the sequence and the totally exploded object at the end. The intermediate stages of the explosion would be automatically worked out. This technique is know as *tweening*.

Of the existing tools, Sculpt-Animate-3D provides the most control over animation. Both path-based animation and tweening are available. The path based animation can be fully *hierachical*. This allows you to build up a big path from lots of little ones. The tweening capabilities can be applied to every aspect of an animation, including colours, brightness of lights, zoom of the camera and so on.

THERE are two versions of VideoScape-3D. Version 1 has limited path based animation, and objects can be tweened or *morphed* as Videoscape calls it. A morphing object could be flying along a path at the same time. Version 1 does not allow hierachical paths. Creating complicated motions, a hatch opening on a moving spacecraft for example, may require a program written to generate the motions. Version 2 allows paths to be attached to other paths, making life far easier.

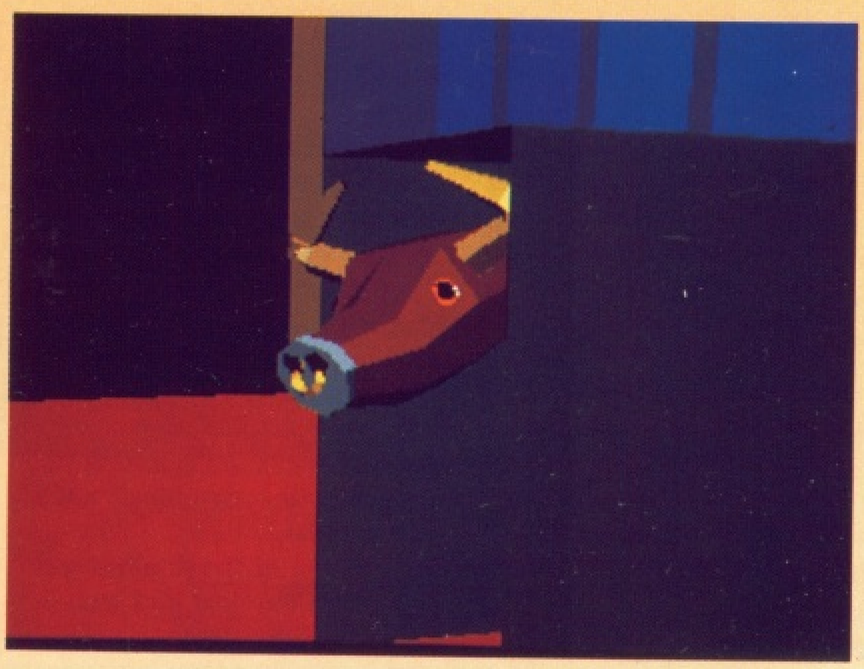
Other packages have similar facilities – Turbo Silver has hierachical path-based animation. Forms in Flight has simple path-based animation, like Videoscape Version 1.

The movie being discussed in these articles has a relatively simple set of animations. The objects do not change shape, they only move. The main motion is the movement of the camera. The various motions are:

- Camera starts at back of auditorium and moves down to focus on speaker standing at podium. It then moves behind the curtain at the rear of the stage and moves in on the bull.
- The speaker is talking – the head is nodding and turning. The body is rocking backwards and forward. The arm is waving.
- The bull's head is nodding in some semblance of chewing.

Of these motions, those of the speaker are the most complicated, and will be a hierarchy. Starting at the top of the hierarchy, the torso is moving backwards and forwards, bending at the hips. The torso is one object, while the legs are stationary. The torso is given an oscillating path within Sculpt-3D.

The first step is to make a circle. This is then scaled in the east to west direction so that there is no side-to-side motion. This path is then scaled so that its length is about half the depth of the torso. The path is not attached to anything else, it is at the ▶



The bull's head needs a small path to create a nodding effect

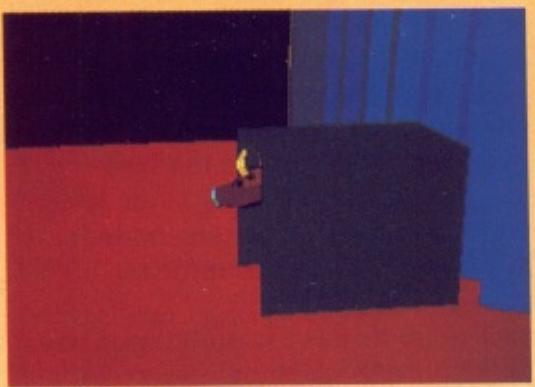
top level of the world hierarchy. The torso is attached to this path as a *child*. The path is in the centre of the torso.

The torso will now oscillate backwards and forwards. There is one slight problem, the top of the legs and the bottom of the torso are not connected, giving the impression of a bad magic trick. The path is modified so that the torso tilts while it moves along the path, keeping the bottom of the torso at the same position as the top of the legs.

We now have a torso waving back and forwards. When creating paths, it is often worth working on them at a large scale, and then scaling to be very small in one or more directions. The torso's path is a loop, in this case of 20 steps. The path will be repeated as necessary.

Remaining paths in this hierarchy are constructed along the same lines as the basic one for the torso. Two paths are added as children of the torso's path, one for the arm waving, and one for the head turning side to side.

The arm is similar to the torso. A path is attached half way up the arm that is a circle squashed in one direction. The pitch and roll is



Most of the bull is hidden

modified so that the arm stays connected to the shoulder. The head has a further path before it is attached, a small nodding path. The hierarchy is as follows:

```
Torso_wave -+- Torso ---- Left_arm
            +- Arm_wave - Right_arm
            +- Head_wag - Head_nod --- Head
```

The left arm was originally going to be given a path that kept the left hand in contact with the podium. This was later changed to keep the arm at the side of the torso, since the camera would not be able to see much of it anyway.



By keeping the right arm still the number of paths can be reduced



The link between the bull and the man still needs to be established

HAVING created a complicated set of motions for the speaker, none of which caused anything to actually go anywhere, the next path is that of the camera. Within Sculpt-3D, the camera can be attached to a path and be given roll and tumble just like any other object. This path was created using a *spline*.

The length of this path in points will be the length of the final animation in frames. The current estimate for the number of frames is 128. The two endpoints were made, and a straight line put between them. This was then subdivided seven times.

Having created 128 points, a few were picked as key points and dragged to important places, selected, and the whole thing made into a spline, the remaining points sprung into the intervening locations.

After defining the path of the camera, the pitch and roll must be modified so that the camera keeps pointing at the areas of interest. This is done by hand and with judicious use of wireframe previewing.

During the first part of the path the point of interest is the speaker. Having moved up to the speaker, the camera slides sideways through the curtain and the point of interest is now the bull back stage.

The speed of the camera movement is controlled by the distance between points. In this case the points are bunched up at the point where the camera moves up to the speaker. The camera slows down as it moves up to the speaker and then accelerates away.

The final path to be added is that of of the bull's head nodding. The same techniques that were applied to the speaker are used here.

This animation has made extensive use of paths, including hierarchy to get paths attached to paths. Creating the paths requires a large amount of previewing, the wire frame preview modes of both Sculpt-3D and Videoscape-3D being both ideal for this.

To create smooth motion, both of the camera and objects, the paths are constructed from smooth objects such as splines and circles.

A common situation is to have an object moving on the spot, such as nodding or spinning. In these cases it is a good tactic to make a path and then shrink it so small that the object does not go anywhere. An example is to get things to spin – make a circular path and then shrink it to a point size.

With the objects hooked together, the next stage is to generate the individual frames. The wire frame previewing during the animation stage should have sorted out any problems of the camera pointing in the wrong direction, or objects not coming into view.

The generation of the final images is the subject of the next and last article in this series.



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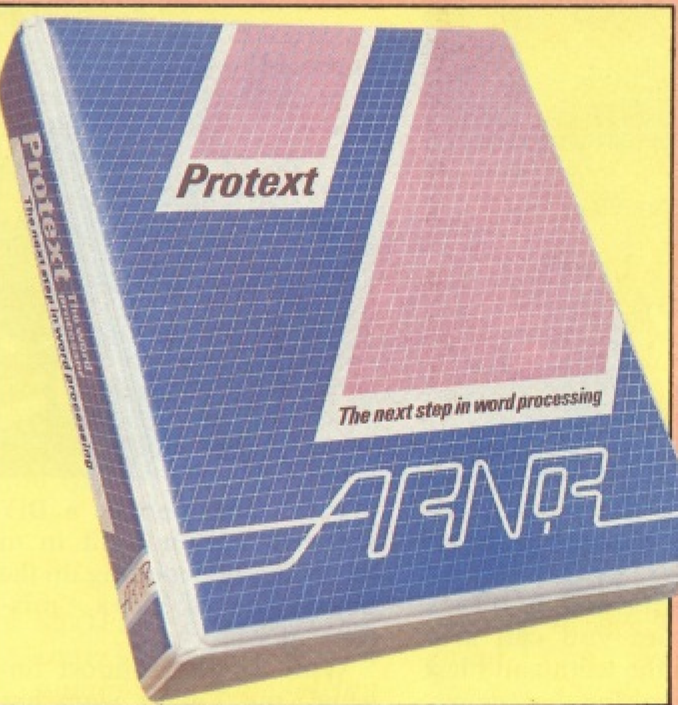
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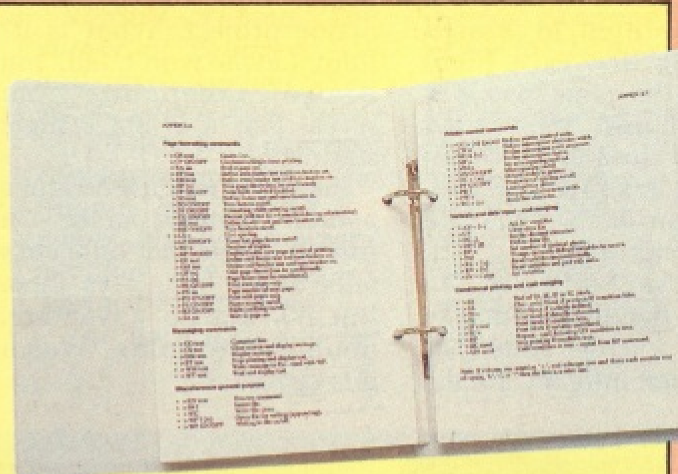
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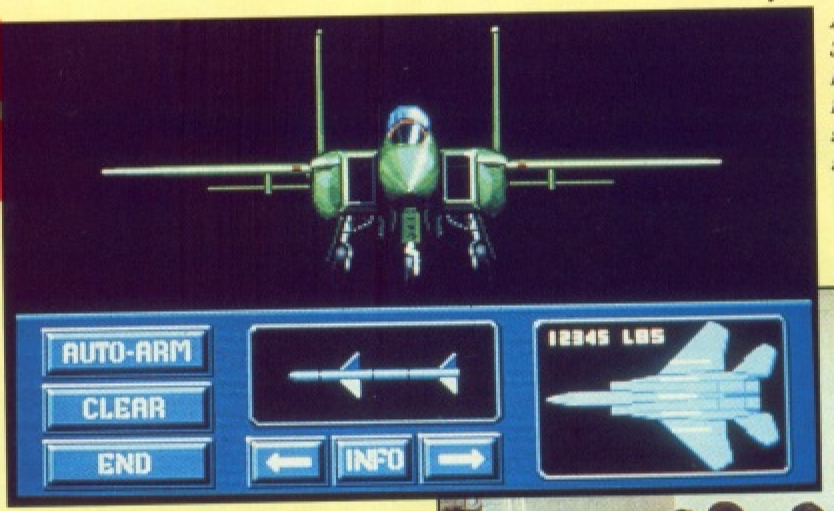
'...merely the best word processor for the Amiga'

– Reviewed in Amiga Computing January 1989

TO ORDER YOUR COPY, TURN TO THE FORM ON PAGE 97

Amiga Arcade

Bomber that's a blockbuster



Arming the F-15 Strike Eagle in Bomber, the working name for Activision's summer release flight simulator

VEKTOR GRAFIX, the team best known for its wire frame 3D images in The Empire Strikes Back, has signed up with Activision to produce four original titles.

The game under development right now is almost complete, with conversions, the ST among them, lagging two weeks behind.

Given the working title of ***Bomber***, it is a variation on the flight simulator theme. Vektor has created a game where the player can choose any plane from a list of the most exciting modern aircraft around, including the Tornado, F-15 Strike Eagle, F-4 Phantom, F-111, Saab Viggen and Mig 27 Flogger.



The Bomber team surround Vektor Grafix founder Andy Craven (back wall, black sweater) while co-director John Lewis (far right, on the table) guards the loot.

Everything is different about each plane, even the handling, and you will be able to fight one of 14 potential computer controlled adversaries.

Vektor founder member and director Andy Crane came up with the Bomber idea while conducting research for a game that never happened.

He discovered that every year the USAF Strategic Air Command plays host to the Curtis E. Le May International Bombing Competition (God Bless America and all that).

Andy realised this was a natural for the home computer and, together with his 11-strong programming team, has turned it into a game where you can arm your jet to the teeth and blast away at anything that moves.

Vektor co-director John Lewis admitted to *Amiga Computing* that as a flight simulator the game may lack certain features: "We've tried to keep as close to the actual aircraft as possible", he said, "but realism has had to run a close second to fun".

The package will cost £25 to £30 on two discs – maybe three – with lots of background info on all the planes, plus there is a DIY scenario option built in to the the game, opening up the possibility of extra "mission" discs.

With Bomber almost finished, the Vektor team has begun work on its second major project. What is it? John Lewis won't tell, but *Amiga Computing* can reveal that it is not a flight simlulator.

Instead it will use Vektor's natural language parser – "It can do things that Infocom's falls down on", says John. But it's not an adventure. Sounds intriguing. Watch this space...

Gallup Chart

	Title	Publisher	Price	Last Month
1	Falcon	MirrorSoft	£29.95	1
2	TV Sports Football	MirrorSoft	£29.95	3
3	Sword of Sodan	Gainstar	24.95	2
4	Elite	Firebird	£24.95	4
5	Lombard RAC Rally	Mandarin	£24.95	6
6	Operation Wolf	Ocean	£24.95	9
7	Dragon's Lair	Readysoft	£44.95	10
8	Galdregon's Domain	Pandora	£19.99	5
9	Pacmania	Grandslam	£19.95	7
10	Thunder Blade	US Gold	£24.95	–

Down to earth challenge

FROM the creators of the absorbing Joan of Arc (*Amiga Computing* March, '89) comes the visually and aurally stimulating ***Journey to the Centre of the Earth***.

The game has you playing the role of an eminent scientist who has to negotiate echoing caverns and winding passages in an attempt to follow Arne Sakmussen's steps in the Jules Verne novel of the same name.

Stampeding mammoths, cascading rocks and slimy reptiles are just three of the hazards you will have to face. Beat them off, find the correct path and your reward is a stunning 32 colour picture of your next destination.

Review next month, when we'll find out whether the gameplay lives up to the graphics.



Not the centre of the earth, but a resting place on the journey?

All the latest news on the games software scene

First impressions are favourable

REMEMBER Oids and Thrust? Well the format lives on with ***Raider***, the first release from new software house Impressions.

To save the inexorable star system you fly through a set of four planets, killing every turret on each before a small green cog appears. Tractor up the cog and fly to the next planet.

Once you have all four cogs you can enter the powerplant where you have a limited time period to position them and escape before all something-or-other blows loose.

We've only seen a one-level demo so far, but can tell you that if you're a Thrust Thanatic or an Oids Obsessive, pretty soon you're gonna be a Regular Raider. The gravity feels good. Full review next month. Provided the programmers get their collective finger out, of course.



Raider, the first Impressions Software release. Out now at £19.99

REVIEWED THIS MONTH

- Afterburner
- Blasteroids
- Captain Fizz
- Charon 5
- Chase
- Cosmic Pirate
- Denaris
- Hostages
- Motor Massacre
- Populous
- Prison
- Prospector
- Zany Golf

MAX HACKS

- Afterburner
- Faery Tale
- Adventure
- Operation Wolf
- Super Hang On (amazing cheat mode)
- Sword of Sodan
- Uninvited.

STOLEN! The Complete source codes for a number of top selling games.

Shahid Ahmed, the author of Pandora, has had his Apricot Xen 80286, paper-white monitor, 20 meg hard disc and PDS board purloined. The thieves left behind the power supply when they burgled his office in North West London.

The hard disc had the "source of every major game I've written", Shahid told Amiga Computing. *This includes Amiga Pandora, Nightshade for the 64 and some Speccy titles.*

The machine cost more than £3,000, but the source code is much more valuable, since Shahid does not have copies. Fortunately his current project, Last Ninja II, is safe.

Invaders line up

CACHET is a new German software house with a range of budget software. The first releases include ***Slider***, a computerised version of the plastic sliding puzzles that usually cause you to give up in frustration.

It may not be much of a game, but it looks good with wood, plastic and metal finishes plus against-the-clock and auto-solve options.

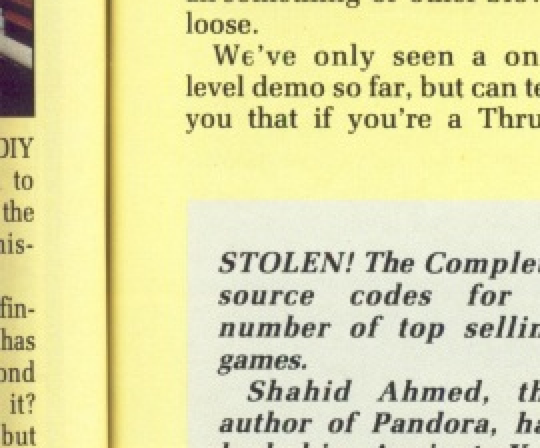
Cachet's driving game, ***Crash and Burn*** looks like MicroIllusion's Turbo. ***Drol***, a compilation of 64 games, might be, erm, good value. The author of Zoom has been busy working on ***Quasar***, a Centipede clone.

Pegasus is a sister label to Cachet producing full priced "quality" software. The first release is ***System 4***, which at first glance looks like a cross between Q*Bert and Bombuzal.

You don't have to complete one level to progress to the next – it takes you from level to level, but if you complete, say, level three you would jump straight from two to four.

The next release will be ***Alien Legion***, sold through Gainstar, a cartoon-like bidirectional scroller.

Later in the year we'll see ***Andromeda***, a scrolly, shooty Defender clone. The boss at Pegasus didn't want yet another shoot-'em-up, but the programmer won the day. It looks as if he's done a good job.




Gainstar's Alien Legion. Will it be blinking good and the jokes get any cornea?

COSMIC PIRATE

Elite plus gonzo graphics

Cosmic Pirate
£19.99
Outlaw

Sound	
Graphics	
Gameplay	
Value	

Overall – 92%

EVER been stuck in the house on a wet Bank Holiday Monday, all the shops closed and you're bored of everything that fits into that inviting slot on your dear Amy?

OK, so maybe you haven't played Death Mutants from the Planet Nong all that much, mainly because it isn't all that good. A real "push it to the back of the drawer and hope it goes away" case. But it won't. Neither will the 25 quid hole it made in your bank balance.

Well, said he in his best washing powder advert voice, the Holiday Monday Blues are at an end. All you need is Cosmic Pirate and your boredom troubles vanish.

So maybe it doesn't have 3D graphics that lurk seductively with the whispered promise of "Wanna good time?" It's got sprites, though, and plenty of them. It was also written by folk who clearly know an Amiga from a Vic.

The instant the disc goes in pretty things start to happen; every home should have the beautifully done animated boot sequence.

Oh, you want to know about the game? All right then, if you insist. You play the part of a rookie Cosmic Pirate who has joined up with the Nest 51 team for safety. Nest 51 happens to be a ginormous space station with all the facilities that a cosmic pirate's warped mind could wish for.

The only swines are the taxes, which run in the 90 to 99 per cent range. You'll still make a wodge of dosh, because piracy is faintly profitable. Nest 51, although totally despotic in nature, looks after its own by running simulators and supplying ships.

The free simulators are there purely to get your shot accuracy percentage above 30; Nest 51 won't let anyone go out without that as a minimum.

Everything gets thrown at you very quickly in a simulator. Time to buy a Konix Navigator Autofire stick, methinks.

The first ship you get is a useful, basic device. Everything works, but don't try anything flash. Once you've booked a mission from one of the 26 grades you are free to zoom off, but not until you've paid Nest 51 even more cash. You'll have an overdraft, and if it gets big some nice people will come and shoot at you.

Once out of the Nest, and after some very pointless but beautiful effects, you arrive in a sector. Things appear that have it in mind to show you that they don't want to be friends with you.

If the feeling's mutual, they'll soon blow up, sometimes leaving little capsules – you'll have seen it in Zynapslapfight III v1.3 (The Revenge) – but they don't just go away if you fail to pick them up, they turn into little guided missiles. These do you a lot of harm. Laffs, huh?

You may notice a little T symbol which moves about cunningly. This is the Hyperspace Portal direction indicator. The portal can be free, allowing you instant travel, but it

AMIGA COMPUTING Excellence





Written by folk who know an Amiga from a Vic



usually costs. If you've harmed enough aliens, you can get through – extra points are saved against the next journey.

Once in the portal, you can move closer to the fish-like ship or towards a planet. Planet strafing is fun, and can be very profitable. But one can come over all dead.

Once you find the ship you shoot it until it gives in. This would be great, but unfortunately it's doing the same to you. Once pacified you guide it back along the spacelanes, shooting all the way. Nest 51 takes the ship, gives you some money – not much – and you are free to continue living.

And so it goes on. It's like Elite minus the 3D bits and the docking, but plus gonzo graphics and fabbo sounds. It makes the most staid, sensible type want to do something very unstaid indeed.

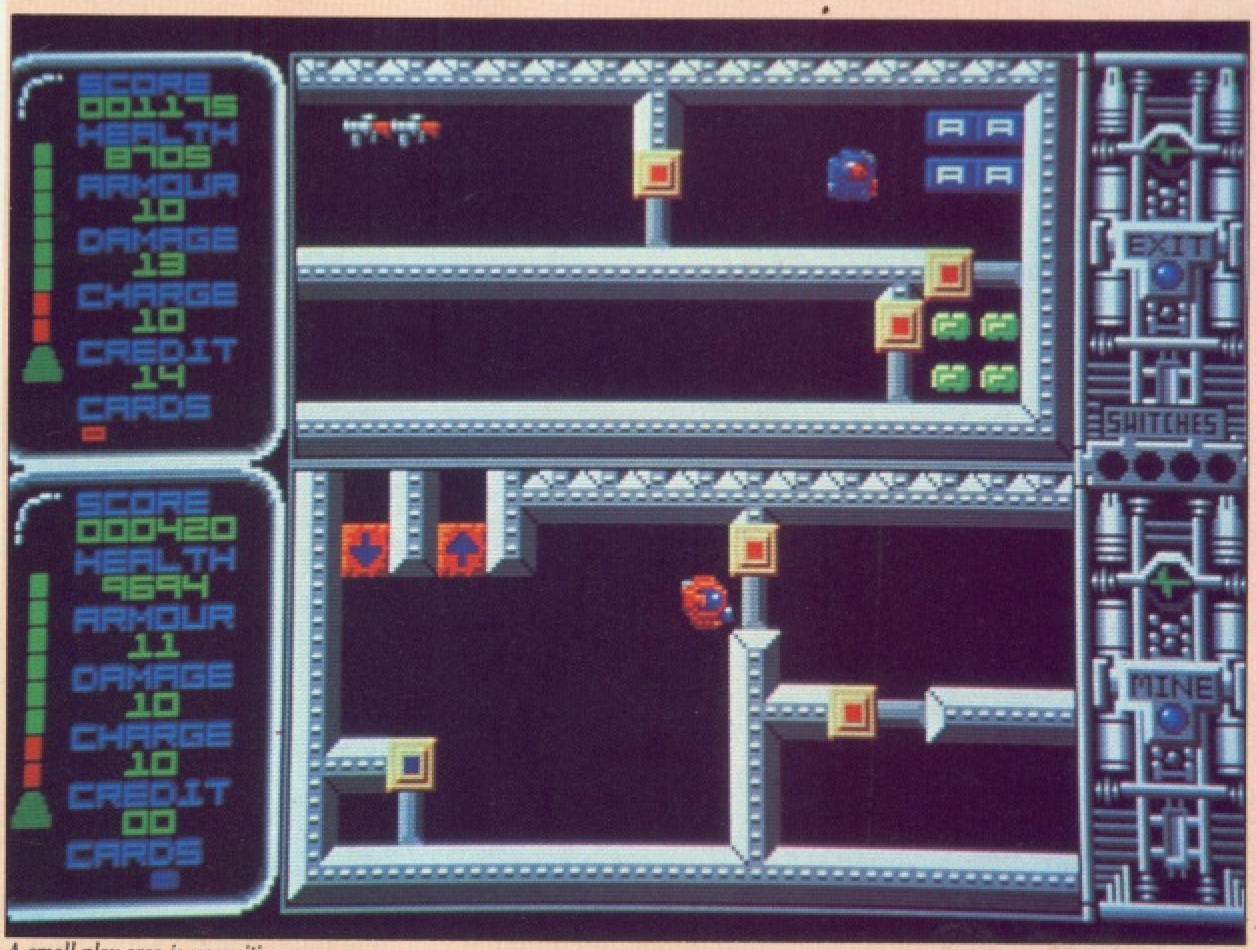
Cosmic Pirate is fun to be with. I've played it for hours and will play it for many, many more. I want to have its babies. Buy Cosmic Pirate and kick some donkey!

Stewart C. Russell



CAPTAIN FIZZ

Cooperate to survive



A small play area is unexciting

GAMES with two-player options aren't new. Captain Fizz is different in that instead of the players competing against one another, cooperation is needed to solve all the puzzles.

The plot is a bit overworked: A starship is out of control and heading towards the sun and only you can save it by deactivating the main computer.

Both players start at the bottom floor in the ship and must get to the top floor using the emergency lift. Before the lift can be activated all the ordinary, non-functioning lifts must be de-commissioned.

Access on the decks is restricted by doorways, which can only be opened if the player is in possession of the correct colour-coded card. Force fields are also in operation and they need a little more thought to overcome. The decks are swarming with the obligatory aliens, moping about and generally getting in the way.

Money can be picked up and exchanged at vantage points for extra health. Various other items can be collected to increase your armour, damage rating and charge rating.

These factors determine how well you can communicate with the enemy and how resistant to damage you are. On the higher decks – the ones with mines going off all over the place, not to mention a kill-crazed missile launcher – a high armour factor can be a life saver.

Another interesting feature is that death is not a permanent condition. If your compatriot is still alive and can make it to the next deck, a replacement clone-brother will be teleported aboard. If the unfortunate should occur and both players are stuck in a logical impasse, one can make the ultimate sacrifice – the suicide switch.

When both players die the game can be reset to the last nearest level, in multiples of five, which saves having to start again from scratch, the prospect of which could send you as criminally insane as the guys who wrote the title music.

The game screen is split into two halves, each showing a plan view of part of the current deck. Scores and the status of each player are shown in a large box on the left. This has the effect of making the actual playing zone each player sees about a quarter of the size of the screen. As a result the graphics are very small and undetailed.

When a player moves out of sight the entire play area flicks to the new zone. With both players running about, the constantly changing screens can be very confusing.

Players can appear in both halves simultaneously – the shock of suddenly coming face to face with your colleague can cause the trigger finger to slip, which doesn't help when the health levels are getting low.

First impressions were that of disappointment because the graphics are small and the sound is minimal. The puzzles, which demand thought and cooperation, are seemingly impossible on your own. Unfortunately the baser human instincts are always drawn out and the game can rapidly degenerate into petty retaliatory tactics.

John Kennedy and Green

Captain Fizz
£14.95
Psygnosis

Sound	
Graphics	
Gameplay	
Value	

Overall – 72%

MOTOR MASSACRE

Worse than the M25 on a wet Monday

Motor Massacre
£19.99
Gremlin Graphics

Sound

Graphics

Gameplay

Value

Overall – 75%

THE holocaust has come, laying waste to vast tracts of once beautiful countryside. Out of the devastation emerges a breed of survivors, barbaric in their thirst for power and dominance. To survive even a day is hell.

You must compete in the most horrifying carnival of motor destruction ever conceived. No, it's not the Stoke Poges by-pass on a wet Monday morning but Motor Massacre from Gremlin, the latest addition to the "car is an extension of a man's joystick" school of games.

Cause of the problem is the evil Dr A. Noid, creator of the vile and mind-bending food substitute Slu. Now everyone is trapped in the cities, unable to break free from the grip of Slu addiction. Killer cars cruise the streets, strung-out zombie mutants roam abandoned buildings searching for a healthy victim to contaminate – you know the sort of thing.

Your mission is to seek and destroy the mad doctor, and you're going to have to fight your way through three cities to find him.

You must locate the supplies that will help you survive. Money doesn't mean a thing, food does – but first you've got to find it. You cruise at the controls of your Armoured Tactical Vehicle (ATV) through city streets filled with hazards such as oil slicks, gun turrets, land mines and enemy cars intent on ramming you, searching for the entrance to one of the derelict buildings.

Inside you find the food you need to trade for fuel, weapons, ammo and repairs to your battered ATV. But take care, the buildings are full of slimy mutants. They're slow and easy to blast but there are a lot of them and if one touches you your health level drops. If it drops too far...

Before you can leave the city you must find a pass to the arena. There you must take part in a demolition derby. Your ATV converts into a Ram-Car. This is smaller and more manoeuvrable than your opponents.

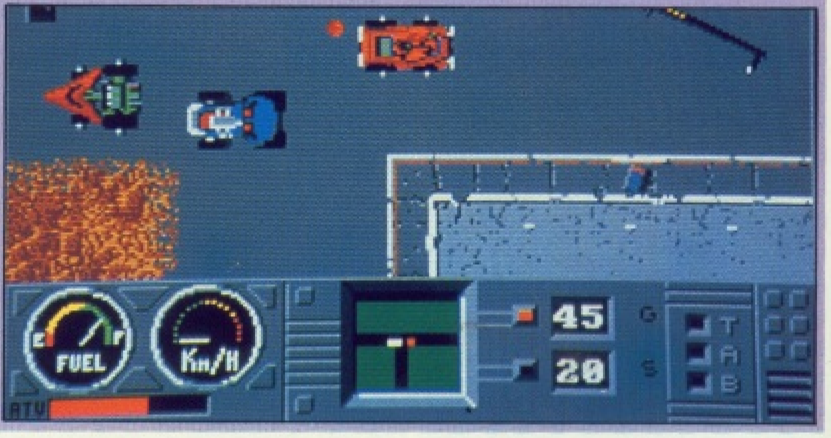
No guns are allowed in this contest – the only way to destroy your enemy is to ram him often enough and smash him to bits. Land mines, flipping floor tiles and the bottomless pit that surrounds the arena all add to the fun.

Once you reach the second city it all becomes much tougher. You have to shoot the cars more than once to destroy them, the mutants are harder to kill and the battle in the arena needs all your skill. It gets worse for your final battle with the mad doctor when you reach the third city.

Computer games are becoming ever more complex. This can result in a game that is thought-provoking, needing both strategy and subtlety for success. Motor Massacre is about as subtle as a brick in the ear. There is nothing new about the gameplay nor about the obstacles to be overcome, there are just a lot more of them than you'll find in most other games of this type.

A save facility is available so that a lot of hard work need not be lost in one moment of madness and the increasing levels of difficulty are well paced. This is a game that will hold your attention and keep you entertained for some time. And that has got to represent good value for money.

Mike Rawlins



CHASE

Into battle with a mouse

Chase
£9.99
Mastertronics

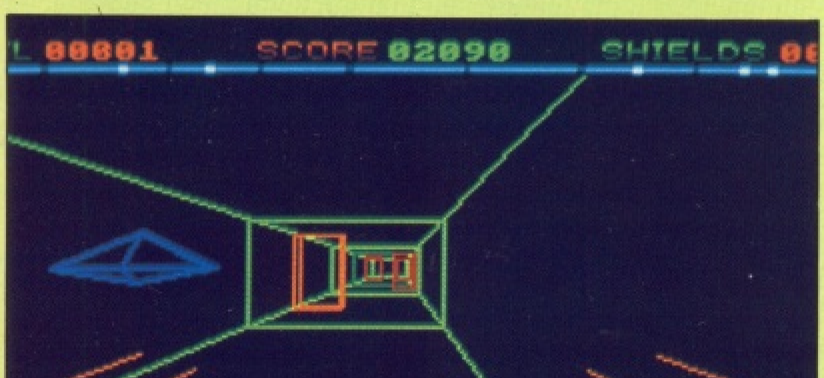
Sound

Graphics

Gameplay

Value

Overall – 42%



WE will dispense with the blurb on this one because quite honestly you've heard it all before – the usual stuff about a captured princess and a gallant pilot setting off to face the enemy hordes. Basically you have to dodge things and shoot down the foe.

There are several stages. Firstly the initial pursuit phase in which you must pilot your craft through a wire frame meteor field and shoot down the enemy. If you survive this you must take on a sort of giant slalom run, weaving in between giant monoliths. Not quite sure why you have to do this.

After that it's off to the Quadrilateral Vortex, otherwise known as flying through squares. This is quite difficult because there are obstacles in the tunnel which you don't see before it's too late. Then you must zap a few more baddies.

Where Chase really falls down is that you can only play it with the mouse. Before you buy a mouse-only game there are a few questions you should ask yourself, like "Have I got a really large desk?" and "Would I really like to pilot an expensive spacecraft with a mouse?"

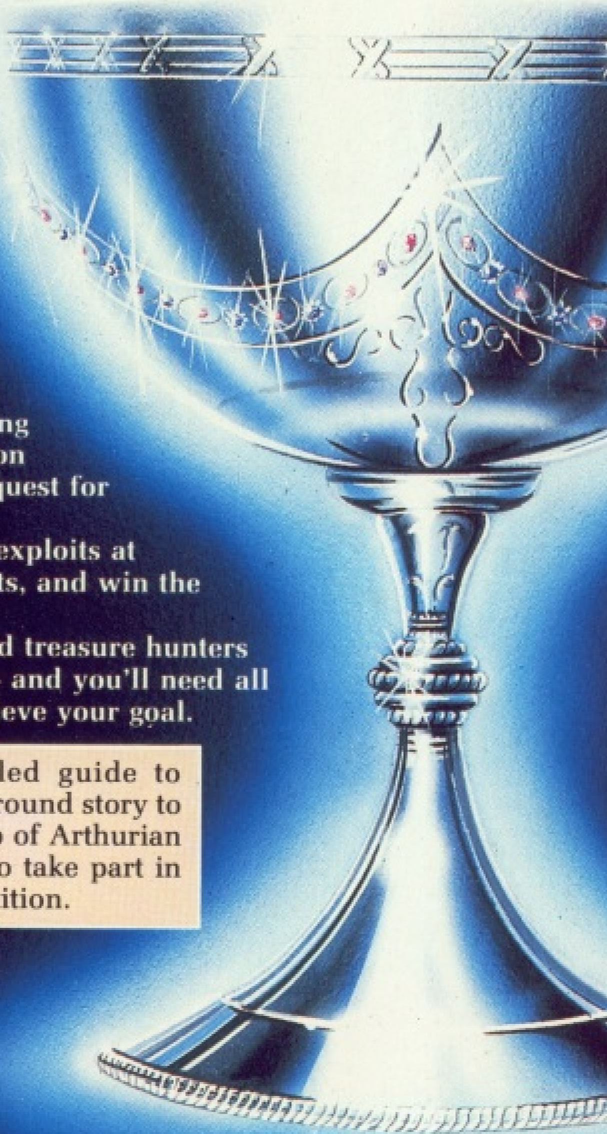
The vector graphics are done quite well, except in the vortex tunnel, where it is difficult to determine whether that thing up ahead is a yellow square or a red square with a yellow square displayed on top of it. A mistake is usually fatal.

Also more thought could have been taken with the choice of colours. The instructions describe the enemy ships as being "a sort of putrid blue colour". It is difficult to argue with them on that point.

This is a budget game. Prices are quite high on standard Amiga software, but at least with games like Falcon you can feel certain that a large proportion of the cost actually went into development and not into high interest bank accounts.

Green





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Screen shots from Atari ST version







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POPULOUS

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Sound	
Graphics	
Gameplay	
Value	
Overall – 87%	

FEELING a little run down, are we? Things not quite going the way they should? What you need is a dose of omnipotence – create your own planet, colonise it, nurture it, that sort of thing.

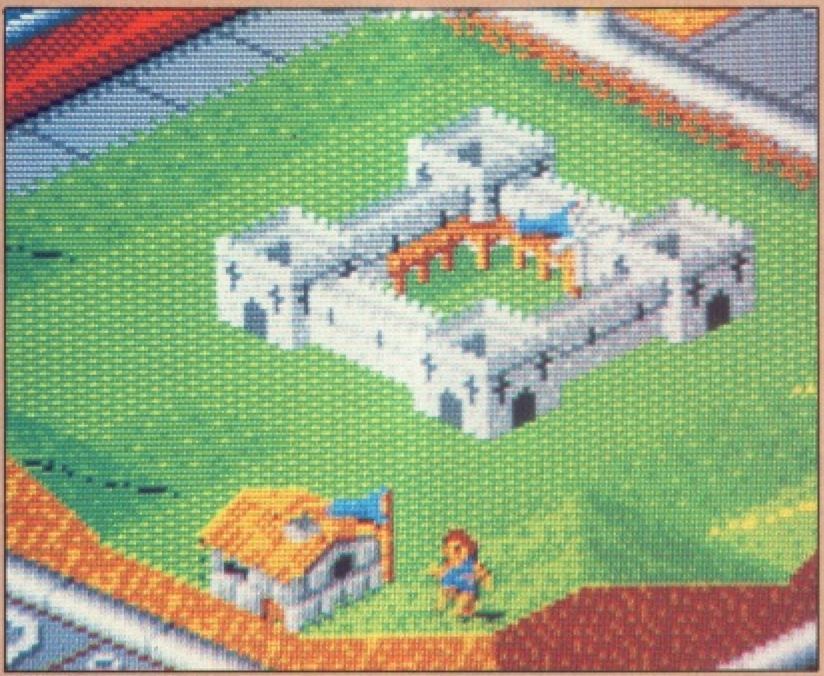
And if another pseudo-supreme being should happen by, you can destroy him, plus all his misguided followers.

The idea behind Populous is to be the best. Top God, as it were. You start off with three followers, known as Walkers, a leader, some land and a religious centre, the Papal Magnet. The more the Walkers worship you, the more power you have. The more power you have, the more you can do for your people, thus generating more worship.

You can also do the dirty on the followers of the opposition, either Evil or Good, dependant on your alignment. Doing the dirty can be the relatively harmless nicking bits of landscape, to the positively ultimate Armageddon. If you don't have a very large following in the Final Battle, Armageddon outa here. Ah, the joys of cheap and unavoidably obvious puns.

Your people can build on flat land – the larger the area, the more secure the settlement and the stronger the followers produced.

Your Walkers can settle and multiply, gather to form a powerful Walker, make their way to the Papal Magnet or fight any infidels about the place.



A deity's home is his castle

They're more likely to do these things if they have plenty of good ground and as much protection from the other side as possible. They will usually ignore enemies unless they are attacked or you have instructed them to fight.

Leaders can be transformed into knights who carve huge inroads into the enemy with a joyous gesture after every victory. Knights are the quickest way to gain dominance, although creating one takes a fair slice of manna.

Once your people have boosted your manna supply to an adequate level, you can start damaging the opposition. How about earthquaking them? Building swamps whiles away the millennia, especially when the opposition are apt to fall in them.

Volcanoes are fun; damage is repaired by razing the area to sea level and then rebuilding it. Total enjoyment, were it not for the fact that the opposition is doing the same to you.

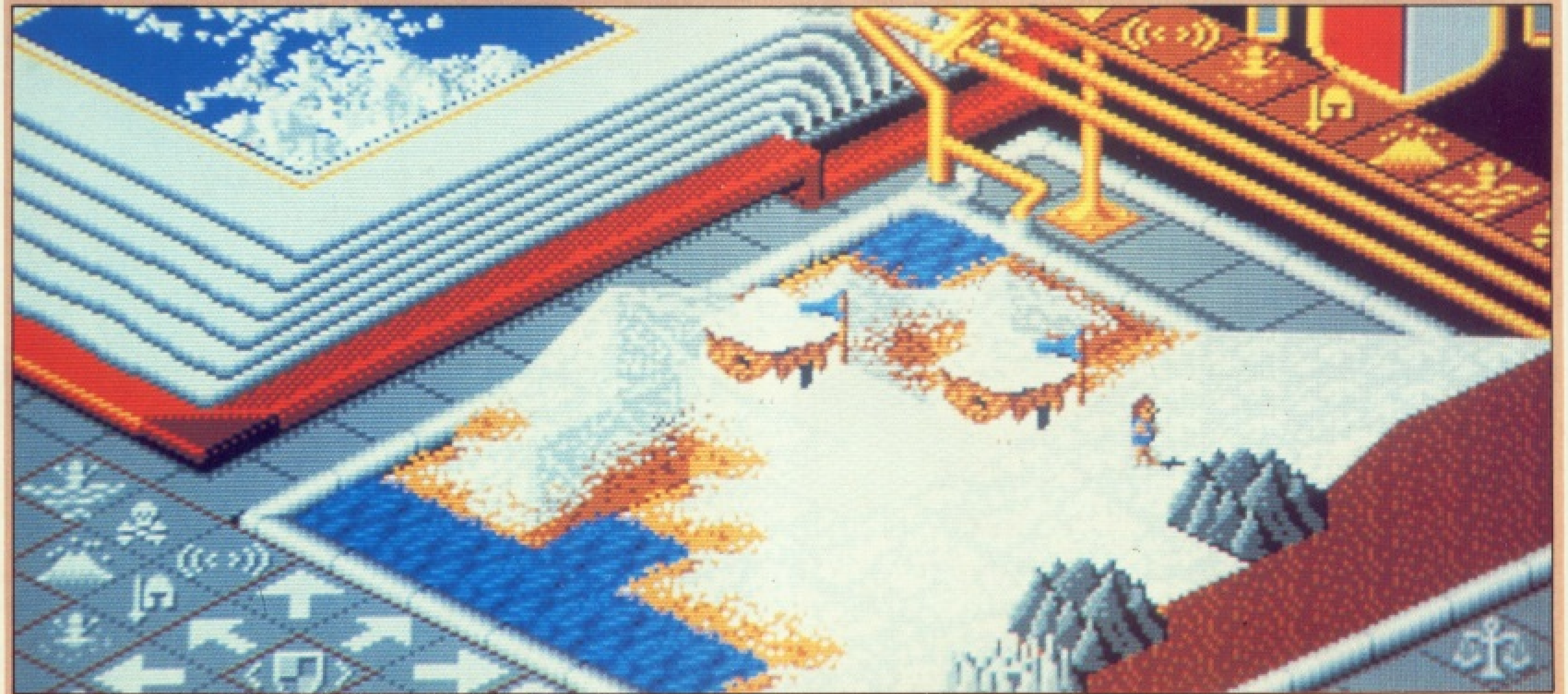
Once one world has been won to your cause the next one in your campaign will be more difficult, with harsher terrain and a more intelligent enemy. Apart from the enormous flexibility of the game options – you can even make your opposite number very stupid – the really smart feature of Populous is its comms feature.

Usually the game is single player, but with the addition of a modem two can compete. More sociable types can use a null-modem RS232 lead and talk to someone at a closer range. High baud rates increase the speed of movement, and all versions of Populous use the same protocol, so Amigas can talk to STs. I can forsee many budding deities having trouble answering to a very large phone bill – a short game takes an hour.

The graphics are neatly isometric and the sound is suitably big for a game about supreme beings. What could really be done without is the flashing of the power LED on the Amiga casing in time to your heartbeat. Nervous types may assume a crash.

If the world's getting too much for you, build your own with Populous. It'll take you more than six days, and you won't want to rest until you're finished.

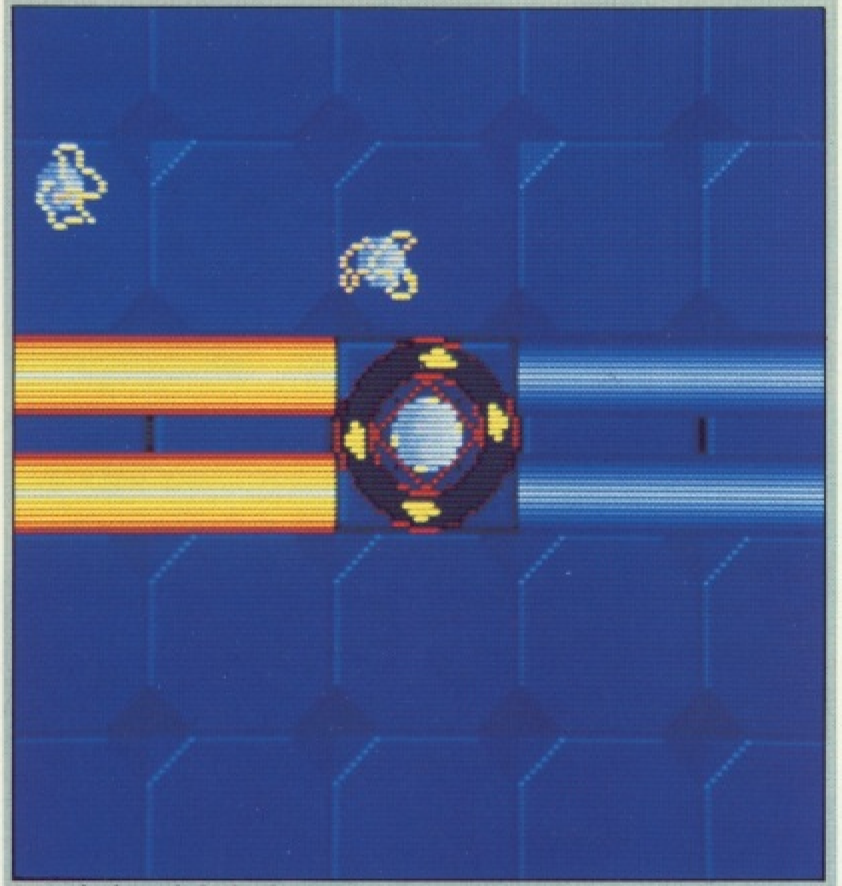
Stewart C. Russell



EA's very own square world

CHARON 5

Plot's tiredness shows



Boring landscape lacks detail

AFTER an odd start the scenario for this game is fairly standard stuff. Board the mysterious intruder, which is called – surprise, surprise – Charon 5, get captured by aliens, become trapped in a tight corner, blast your way out.

There are some almost superfluous trimmings such as repair of damaged airlocks and control circuitry, but they are really a euphemism for yet another scrolling shoot-'em-up.

According to my juvenile psychologist I am supposed to be a superior thinker with quick reflexes. Clearly I am neither, judging by my progress so far. The circular ship, known as a HUMAN – Highly Usable Manoeuvrable ANdroid – is viewed from above. It moves across a rather boring landscape, almost completely devoid of detail.

Most of the time HUMAN is wedged tightly in a narrow channel. Only occasionally do these channels open out into rooms, where the nasties lurk. They generally look like small balls of cotton wool and are fast, evasive and can take several direct hits before they are destroyed.

The consequence is that it is only too easy to get blown up within a few seconds of starting off.

Pressing Fire while hovering over certain objects on the ground will transfer you to one of the computer screens. Here you can mess around with the components needed to fix the airlocks and other broken bits.

Unfortunately the methods of control needed to do this are very complicated and frustrating. You need balletic grace with the joystick.

The most serious condemnation of Charon 5 is that it doesn't look like an Amiga program. It could easily be mistaken for a competent CPC or C64 offering.

The plot is tired, the means of progressing beyond the first screen obscure, the graphics uninteresting and the colours dull. There is some enormous, smooth-scrolling text on the startup screen, plus an excellent rotating logo on the loading screen, but the unfortunate tendency to use 80 column text makes for poor viewing with a television.

Alastair Scott

Charon 5
£19.95
Precision

Sound
Graphics
Gameplay
Value

Overall – 28%

AH, the great British holiday. Two weeks of well remembered pleasures and traditional delights at Sludgethorpe-on-the-Mire. From the moment you're evicted from Stalag Seaview by dear old Mrs Muldoon, the tattoos on her muscular forearms glinting in the cold light of dawn, until the hour when footsore and weary you trudge back to face a welcoming plate of Salmonella Salad, your day is played out according to a time honoured ritual.

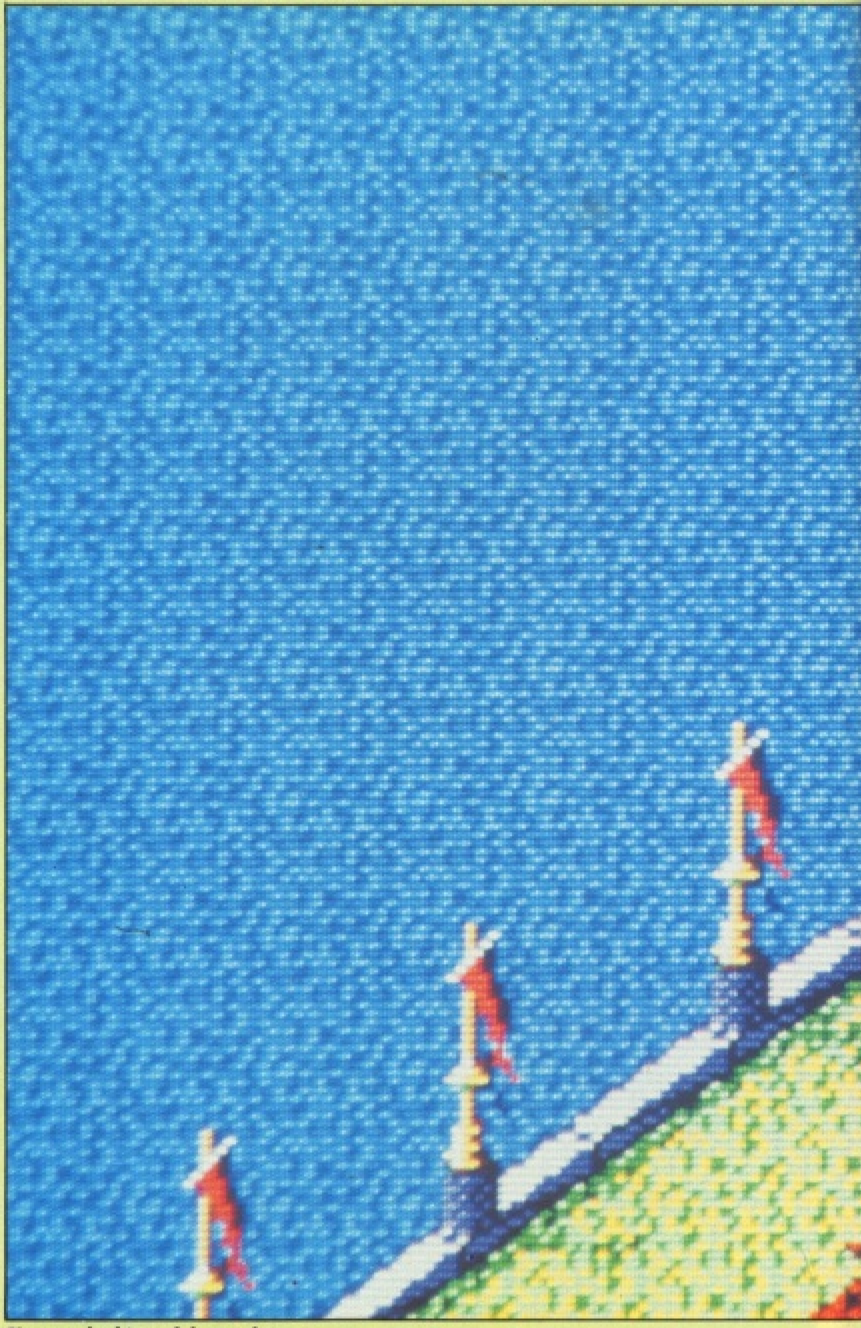
Long hours spent sheltering from gale force winds and driving rain, huddled for warmth around a cup of lukewarm Bovril; bone shaking rides on an evil tempered donkey around the Sludgethorpe Municipal Car Park; and above all else the activity without which no holiday would be complete, the countless rounds of crazy golf. No other British institution is capable of dividing families with such ruthless efficiency.

Dad, with his 15 handicap and a putting stroke as demonstrated by Sandy Faldo in Golf Monthly, spends 40 minutes trying to force his ball up a pig's bottom while six-year-old Johnny, with a style that Sean Kerly would be proud of, whips round the course twice in two under par.

Memories are made of this.

Now you can recapture the thrills and excitement in the comfort of your own home. Zany Golf is as entertaining, offbeat and totally frustrating as the real thing – and more. From the opening screen with its superb graphics and music it is apparent that this game is a bit special.

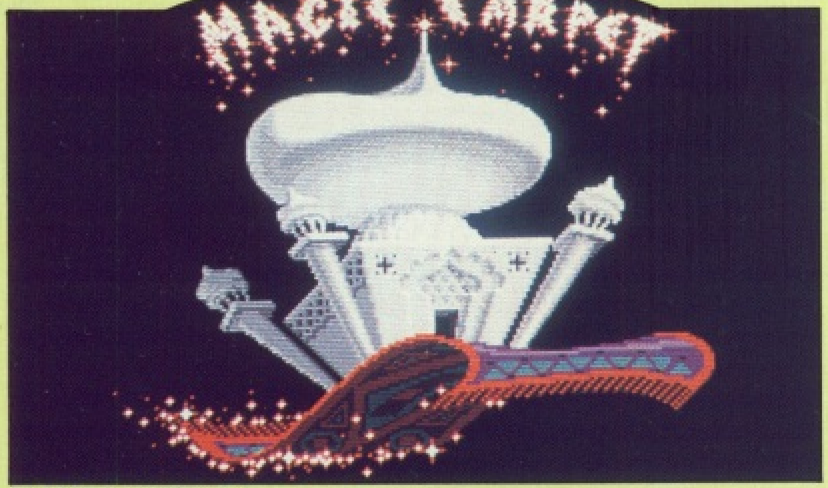
The basic mechanics are simple. A round of Zany Golf consists of nine



You can be king of the castle

ZANY GOLF

Frustrating as the real thing



Each hole has a title page

holes and can be played by one to four players. The mouse is your putter and is used to spot the cursor on top of the ball.

Holding down the left mouse button reveals an X under the cursor. Moving the mouse in any direction with the button held down produces a dotted white line that indicates the distance and angle of the putt.

The further you pull the mouse back, the harder your putt. Release the mouse button to play the shot.

Each hole must be completed within a specified number of shots, otherwise you're out for the rest of the round. The first hole is a par two, although you are allowed up to five putts. Any unused putts are added to the par for the following hole to determine your stroke allowance there, and so on.

From time to time bonus shots are available either for completing a hole within a time limit or for hitting a fairy with your ball. A score card can be viewed to keep track of your progress.

The holes themselves are colourful, superbly detailed and have been designed with a good deal of imagination and wit. Windmill, the first hole, is the one that is closest in design to those found in real life.

Zany Golf
£24.95
Electronic Arts

Sound
Graphics
Gameplay
Value

Overall – 95%

You putt up a slope and past the mill's revolving blades in order to send your ball on to the lower half of the hole. From here on in it gets progressively more surreal.

On the second hole, Burger Bar, you have to putt round a U-shaped track by bouncing your ball off a large bottle of ketchup into a hole protected by a giant, bouncing quarter-pounder.

Ant Hill finds you trying to knock your ball into a hole that is situated on the plateau of a pyramid shaped hill. Just to make it more difficult, the hole is moving.

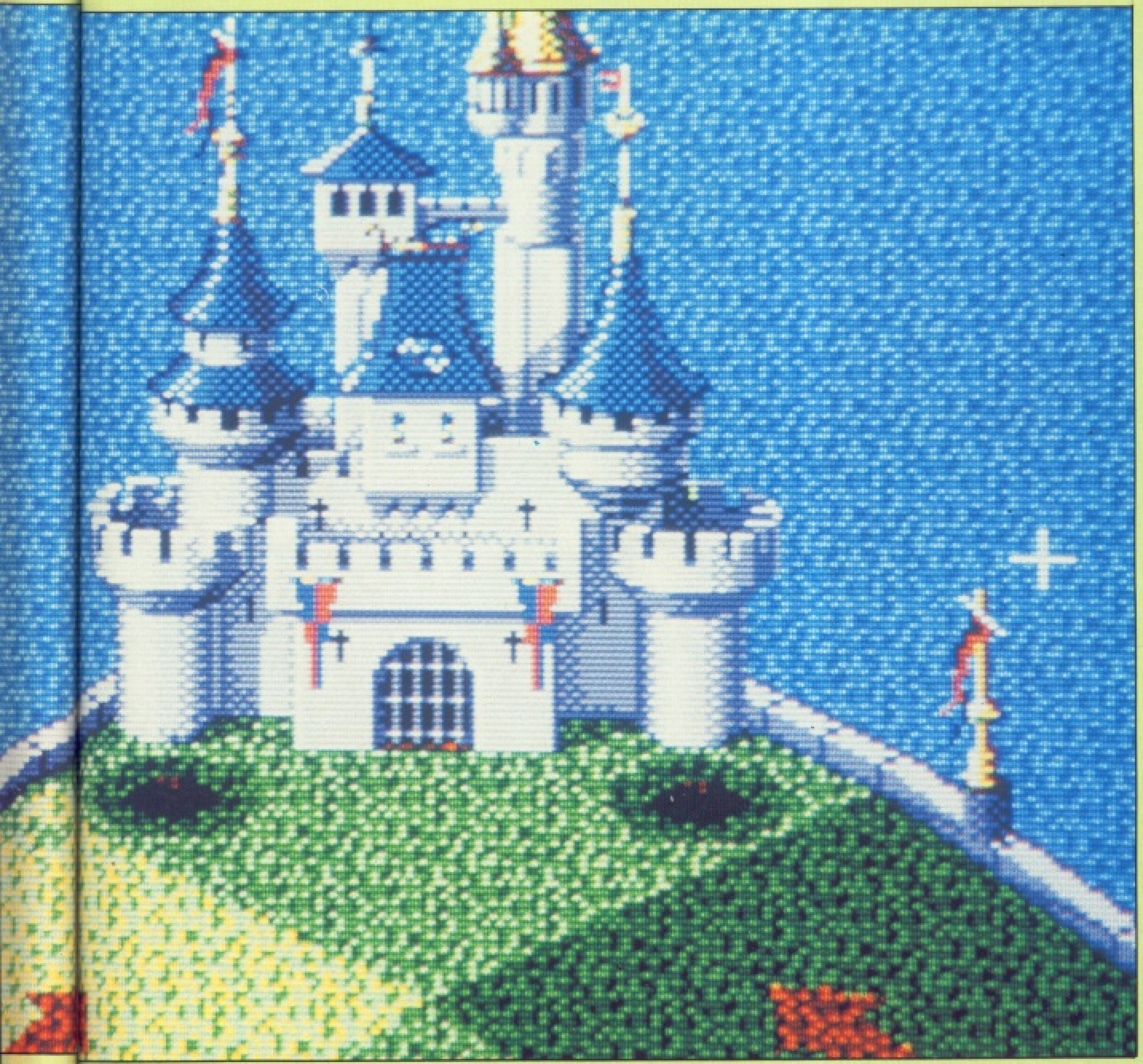
Energy, the final hole, is a lulu, a sombre, mechanistic landscape, criss-crossed by energy beams waiting to blast your ball into oblivion.

Merely completing a round needs a lot of skill and a liberal helping of luck – to do so under par is another matter. One slight nigglette is that it takes an age to load each hole, probably inevitable given the level of complexity involved.

The game can be loaded from a hard disc, so those of you lucky enough to own one – both of you – shouldn't experience this problem.

Zany Golf is not a game that you would want to play continuously for a week. Neither is the real thing, they are both best enjoyed in short bursts at frequent intervals. There can be few better games available at the moment.

Mike Rawlins



AMIGA COMPUTING
Excellence

HOSTAGES

Your chance to join the SAS

LONG ago some bright misguided spark hit on the idea of demanding things with menaces. Clearly this must have gone through some evolutionary problems, because demanding a ransom for a mother-in-law sometimes ended up satisfying for one party and annoying for another.

After a while the captors got so sick of being grilled on whether they had a clean handkerchief that they gave themselves up voluntarily.

Hostages is not so trivial. Here we have a meticulous reinaction of a siege situation. Designed with the aid of the French National Gendarmerie, it has three basic stages – deployment, entrance and neutralisation. That last one sounds pretty ominous.

Terrorists of unknown persuasion have taken hostages in an embassy. You, as the team leader, must arrange the deployment of six specialists – three marksmen and three Direct Intervention Combat (DIC) soldiers.

Your team of three marksmen must take up places which will provide covering fire for the DIC men. These positions are given on a map, which also shows where the men are currently stationed.

Positioning the men entails running along the street past the embassy, dodging into doorways to avoid the terrorists' searchlights. A digitised "Aargh!" followed by your man falling over is a sure sign that you need some more practice.

If one or more of the team gets shot by the terrorists the game goes on, but with a greater risk of failure since the DIC men need all the backup they can get.

Once dropped off by helicopter, the commandos abseil down the building to gain entry through a window. The marksmen can provide cover at this point – a terrorist could be lurking in the same room. More digitised "Aargh!"'s either mean that there was indeed a terrorist in the room, or that you have run out of rope while abseiling.

Once inside – more digitised bangs and crashes – the hostages must be taken to the safe room in the embassy, and any extant terrorists must be remedied with your Walther PPK. Being devious types, the terrorists often hide behind hostages, making your job a little more interesting.

The embassy has three storeys, each with the possibility of hostages and terrorists. Movement is like an updated 3D maze game, with the corridors moving in byte-sized chunks rather than a smooth scroll.



Commandos abseil down the building

The action sequences proceed in a series of freeze-frames, heightening the suspense – some encounters are truly heart-stopping.

Any hostages found immediately latch on to you. They will follow wherever you go, so it is important to clear out the third storey quickly – that's where the safe room is.

Any number of DIC men can be in the building at once, all at different places. The action can be switched quickly between them, allowing them to eliminate the terrorists on all levels. Once you have either run out of DIC men or terrorists, the game finishes with either a derogatory or complimentary newspaper report.

Hostages creates an air of tension unlike any other action game I've seen. The graphics, although competent, are fairly drab and show a definite ST ancestry. The sound is very well executed; small incidental tunes being variations on a theme, all popping up at the right moments to add to or defuse the situation.

The only real problem is the length of time spent staring at a blank screen waiting for another section to load in. Surely it would not have been too difficult to give some kind of display?

The plethora of playing levels however, along with the suspense, will keep Hostages a much-played game.

Stewart C. Russell

Hostages
£24.95
Infogrames

Sound
Graphics
Gameplay
Value

Overall – 81%



Your team of marksmen must provide covering fire



PERSONAL
NIGHTMARE
There's something very strange going on. It's as if you are living through your worst nightmare and unable to wake up. Won't anyone let you in on the terrible secret that haunts your waking moments.
Personal Nightmare is the new brain child of HORROR SOFT. A new kind of icon-driven, animated game that has been written using the new especially developed Agos language.
Personal Nightmare is highly original using all the features of the 16-bit micro. The superb, fully animated graphics, backed by incredible sound effects come together with a highly sophisticated user interface to give total involvement of a new dimension.
Personal Nightmare will introduce you to numerous characters including:
The Landlord of the Dog and Duck
Jimmy Blandford and his attractive wife Susan
Alice Greenwoood
The local village policeman
and a host of other inhabitants who will share in your Personal Nightmare.
Available on AMIGA, ST & PC
HORROR SOFT
Unit 3, Addison Industrial Estate, Blaydon,
Tyne & Wear NE21 4TE. Tel (091) 414 4611

DENARIS

Ultimate in sideways scrolling mayhem

Denaris
£24.95
US Gold

Sound	
Graphics	
Gameplay	
Value	

Overall – 88%

PREPARE to eat hot gamma rays, Alpha Centaurian! When you read a sentence like that you know you're either about to read an excerpt from Niven and Pournelle's Footfall, or it's the start of another shoot-'em-up review.

In this case it's a review, but before you start complaining, it isn't an ordinary run of the mill, seen it before, read it before review. No siree, because this is a review of the best sideways scrolling shoot-'em-up ever released for any home computer.

Now you all know that those spoilsports at Activision made US Gold keep Katakis off the market until after Christmas because it was so similar to R-Type. Well a few changes were ordered to while away the programmers' time, including the name, and now it's back, better and badder than before. It's a total blasting experience.

It all begins quietly enough with a parallax scrolling starfield filling virtually all of the screen save a small control panel at the bottom.

In troops an attack wave of laser fodder. Waste 'em. An icon pops up. Run it over and a nose appears from the stores, floating behind you. Go back and collect it. The nose is the essential accessory for trendy blasters, the difference between life and death.

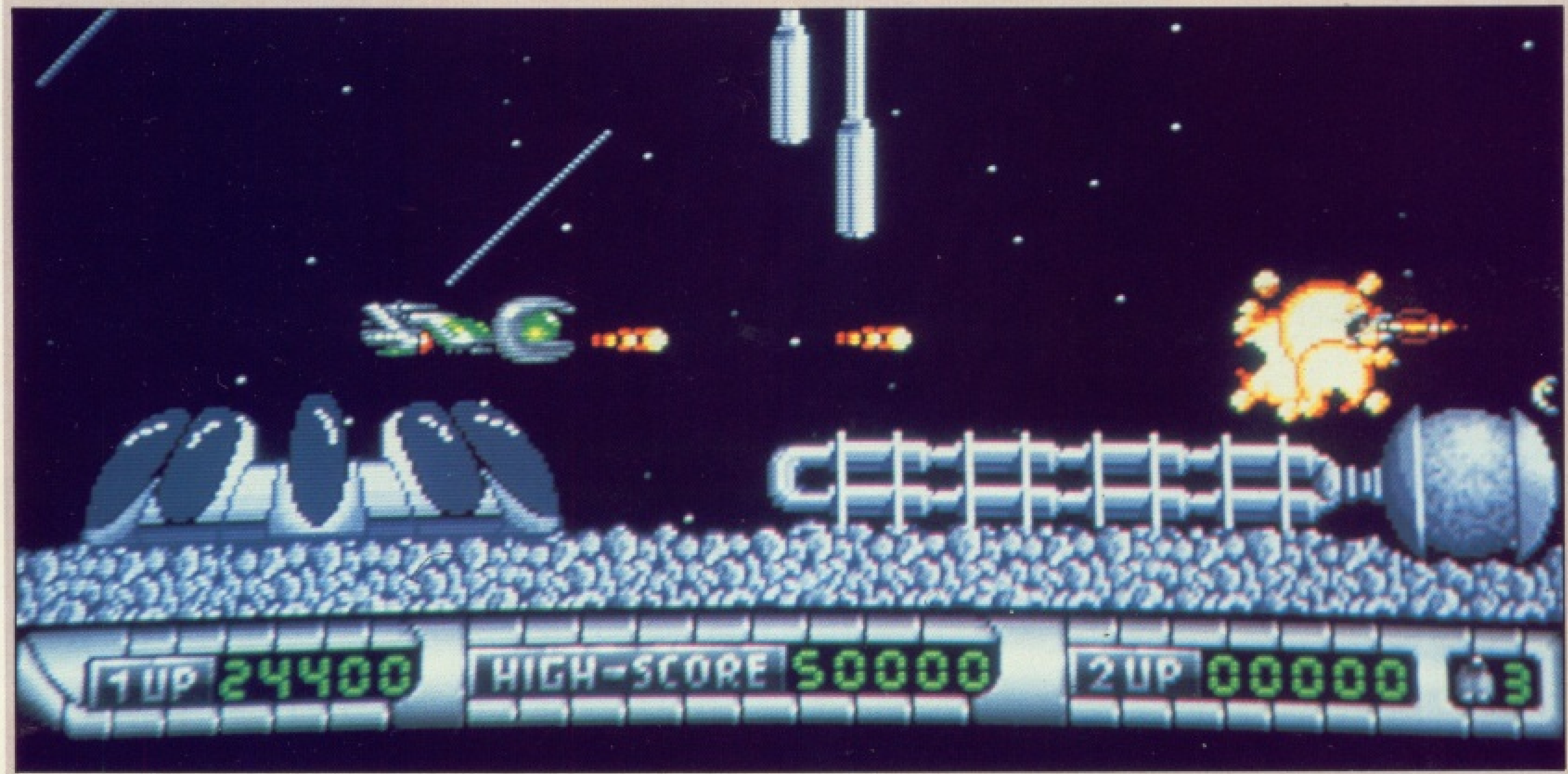
Suddenly metallic-blue scenery scrolls in, missiles come hurtling towards you, stompers stomp across the bottom and floating aliens fire repeatedly. Before you can draw breath the next icon makes an appearance. The phoney war is over, the serious action starts here.

All this lot was actually level two of Katakis, but it has been modified and made easier to form the introduction to Denarish.

On you fly, encountering spiralling attack waves, laser gates dropping from the ceiling, large blocks which pile up blocking the way, hopping aliens, running aliens, aliens on jet-bikes, aliens selling ice creams – only kidding – and not forgetting those lovely icons.

After dispensing with one huge mother of an alien at the end of the level, it's shock horror time on level two as throbbing spheres and wicked looking boomerang-style attacks are just a foretaste of what is to come.

Scenery with nasty barbs and





Alien bashing has never been better

tricky passages is the order of the day. More jetbikers on a road to nowhere are just waiting to die for the cause of entertainment. Then again, I do hear the pay is good.

Tumbling panels – which were first seen in Xevious – and a swirling field of spacemines are two more of the hazards to be overcome before you get to the really difficult stuff on level three.

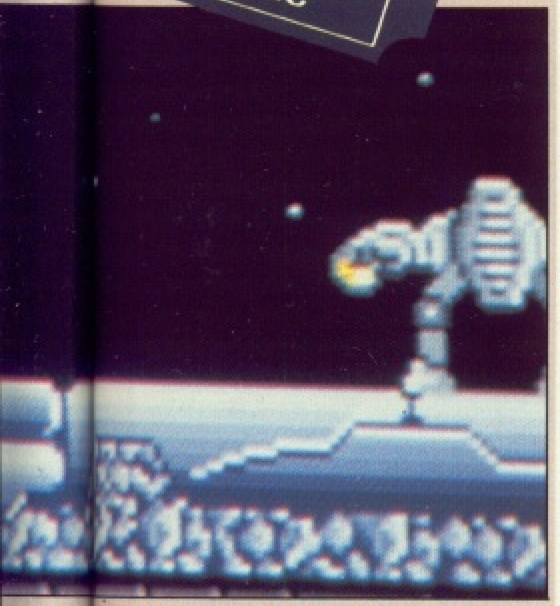
This is a grey metallic hell with little room to manoeuvre and less time to react. Indeed the challenge at the end, which is a total R-Type steal involving a mechanical snake-like device, is impossible unless you have protective pods to keep out the point blank firing.

Around this time you might have collected what I take to be the final weapon to add to your arsenal – homing missiles. My, are they fun!

If you are looking for a game that needs fast reactions, that delivers a satisfying killing experience, that is the ultimate in sideways scrolling destruction, then look no further. Get a copy of Denaris, get that nose, and give those Alpha Centaurians some hot gamma rays.

Duncan Evans

AMIGA COMPUTING Value



PRISON

Aliens have studied martial arts

THE scene is set with some ominous yet funky music. A large domed city is in the distance. As the sun rises over it you can make out some rather large cracks. Clearly this is a city requiring serious repair work.

What is worse is that you are stuck inside it with nothing but a pair of jeans, a T shirt and your wits to help you. You are in Prison.

The display is halved between your various scores, lives, objects held, status windows and so on, and a graphical representation of your whereabouts.

Your persona in the game is a well programmed male figure. He walks and jumps left and right using about 16 frames of animation, and very smooth it looks too.

The backgrounds are well drawn, colourful and detailed. Although the desolation can get very depressing, the occasional touch of humour cheers things up.

The only way to escape from Prison is to solve a series of puzzles using the various objects you will find. These are sometimes hard to distinguish from the backgrounds, so the little red light which flashes on the status screen is appreciated.

If nothing is immediately obvious, selecting the Search option will cause your figure to spin on the spot and have a good nose around. This can get a bit tedious at times, especially when someone has thoughtfully placed some boobytraps.

The same mad bomber has placed mines in the footpaths, so not only do you have to watch out for objects and aliens, but you have to watch where you put your feet.

The puzzles start at the Sun reader level but progress quickly enough to make things interesting. The first problem is how to get the lift doors open so you can move to the next level. Sure enough, not a million miles away you find a plastic access card and a piece of wire.

But now a dilemma: Do you try using the card, or do you bypass the lift door with the wire? The wrong decision means the end of the game. This is where the Save Game option is invaluable.

The arcade action comes in the form of some nasty aliens who seem to have studied too many Bruce Lee martial arts films. You can punch and kick them, but if they get too close they'll take you in a stranglehold from which only a frantic waggling of the joystick will save you.

The sampled sound of some poor soul choking is thoughtfully played to remind you that you are dying.



Prison is a good blend of puzzles and occasional Kung-Fu fighting. Although not startlingly original, it is well done and fun to play.

John Kennedy

Prison
£19.95
Chrysalis

Sound
Graphics
Gameplay
Value

Overall – 71%

PROSPECTOR

Menace in the mazes

Prospector
£24.95
Logotron

Sound	
Graphics	
Gameplay	
Value	

Overall – 84%

IMAGINE sitting quietly having a serious Workbench session when suddenly the urge grips you to play a game. So off you go resetting the machine and loading up Violent Death III.

After a few minutes – give or take an hour – you realise you desperately need to do some Workbenching again. But can you stand the age-long wait while Amy does some booting? Wouldn't it be nice to have a game that multitasks properly?

Enter Prospector in the Mazes of Xor. It multitasks, so Workbench is but a mouseclick away. On an A500 the multitasking will be a little wasted – there will be little over 100k free. It's like Dolby NR on a tape by The Cramps – nice to have, but only useful on an expensive setup.

The title doesn't exactly rattle off the tongue with the greatest of ease, but since it's a sequel, small difficulties can be ignored. Xor – the original – never made it to the Amiga, allowing Logotron to include all the original mazes, plus 15 new ones and a construction kit.

If something is lying around and it happens to be worth something, it won't be lying around for too long if Herb and Pip are about. They have just been to their local fishing shop and bought themselves some jet-packs. No piscatorial purveyor should be without them.

Being young, headstrong and none too bright, they make their way to the Mazes of Xor to have some fun.

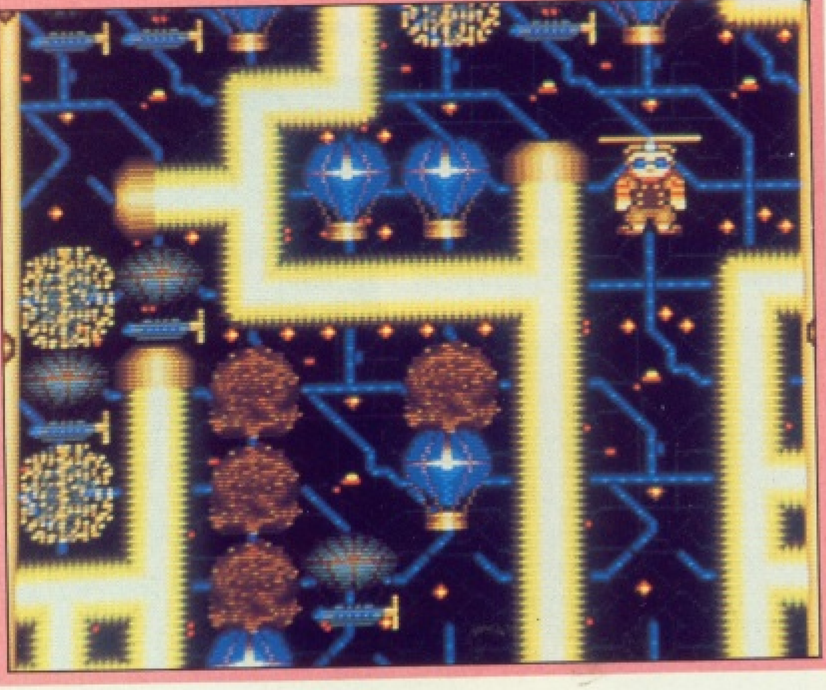
The words "fun" and "Mazes of Xor" aren't usually linked. Xor is an inquisitive and highly intelligent entity who creates bizarre mazes for kicks. Once inside a maze the only way out is to collect all the balloons – an easy task were it not for Xor's warped sense of humour.

Objects litter the place, each of which has its own rules. Zeppelins and Tin Bombs fly to the left, given half a chance. Rocks fall, balls roll, dynamite explodes – fairly predictable, really – but if you happen to block off a balloon there is no chance of recovery unless you know something about logic that everyone else doesn't.

Time is unlimited. You can even call up Workbench in mid-game, but every move is counted by the invisible Xor.

With 30 mazes, ranging from easy to PhD in Extreme Cleverness, plus the chance to design and save 15 of your own, Prospector will occupy the old attention for many a moon.

Stewart C. Russell



AFTERBURNER

Player loses the war

Afterburner
£24.95
Activision

Sound	
Graphics	
Gameplay	
Value	

Overall – 45%

CHEQUEBOOKS at 5 o'clock. With a flash of a Parker on the dotted line, the biggest arcade licence of '88 was won for Activision. The rights to convert Sega's Afterburner for home computers went for between £100,000 and £250,000, depending on who you believe.

It was down to Argonaut Software to create a game which justified Activision's handout to Sega. The F-14 Tomcat is an awesome fighter, capable of taking on six enemy planes at once. Afterburner really tests your flying skills by presenting you and your Tomcat with dozens of enemy craft.

This is no simulator, it's a seat of the pants blast-'em-up. As the skies fill with targets you can take them out with either your constantly firing machine gun or move a crosshair over the foe and target a Sparrow-hawk. This triggers the lock-on logo, while a box on the head-up display shows which target is lined up for the missile treatment.

Your main problem is spotting the incoming missiles among those you have sent on a mission of death. I guess real F-14 pilots have much the same problem. I found a good technique was to alternate between minimum and maximum thrust.

It all gets a little repetitive, although a phase of flying down a canyon is quite fun.

There are interludes to rearm and refuel at the end of each level, all of which have been copied across from the arcade game. A flying tanker can top you up with the best unleaded the USAF can provide, while later on you land among a collection of bowsers and a ground crew.

It is in these interludes that the arcade programmers have included some nice touches. Sprites from other games appear, such as the Super Hang On motorbike and the Out Run Testarossa. They have suffered a little in the translation – I'm told the colours had to be restricted to get a multimegabyte game on to two discs.



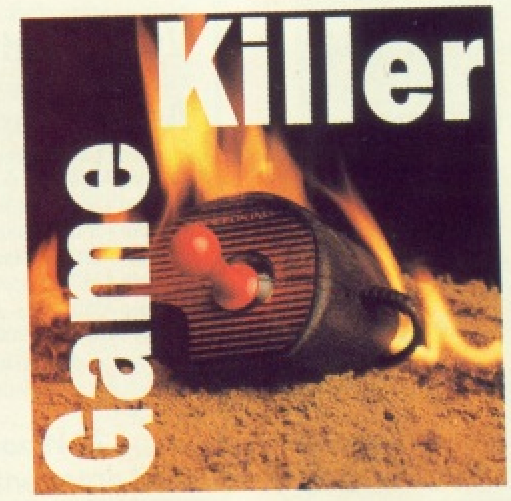
Afterburner was a feast of fast action in the arcade, complemented by great hydraulics. At home the game fails to live up to that, but then there is no way an £500 home machine, even an Amiga, can compete with £9,000 worth of dedicated hardware.

The Amiga version is by far the best, a good deal faster and slicker than the ST game, but still fails to live up to the promise of the screen shots on the box. Activision may be the winner in the battle of the licences, but it is the gamesplayer who loses the war.

Simon Rockman

Happy hacking

It's worth the risk
Hacking a disc
So all you folks
Can have the best pokes.
MTH will demonstrate
With cheats to captivate



By Max Tennant

CHEATING may have become a little unfashionable since Michael Douglas had boiled rabbit for dinner, but that hasn't stopped John Heywood from Anglesey, Gwynedd, putting together a whole bunch of cheats for Uninvited.

He advises you to open the bottle of No Ghost and operate it on the female ghost that appears in the hall. Operate the can of Spider Cider on the veranda. Operate the lamp in the bedroom next to the kitchen. Put the spider on the ghost when it appears.

Operate a knife on the left chair in the entrance hall to find a key, which will unlock the cupboard in the master bedroom and the cupboard in the recreation room. Say: "Instantu illuminaris Abraxas" to the dogs outside the chapel. Say: "Specan heafod abraxas" to the fortune teller doll, the statue in the entrance hall and the head of the statue in the chapel.

A door will open after you speak to the head of the statue in the chapel. Make sure you have the lit candleholder from the chapel. To light it, operate match on matchbox then operate match on candles. Move the cross in the chapel. Operate the golden amulet from the envelope on it to kill an individual zombie.

John also has tips for the Faery Tale adventure. In the Citadel of Doom fall asleep against the blue wall. To do this make sure you are very tired, that you are right up to the wall and that you are carrying a bow and some arrows with which to kill the necromancer.

The lava is awkward to get across. Use the vials to get your vit up. Then save the game by the lava and keep trying to cross it.

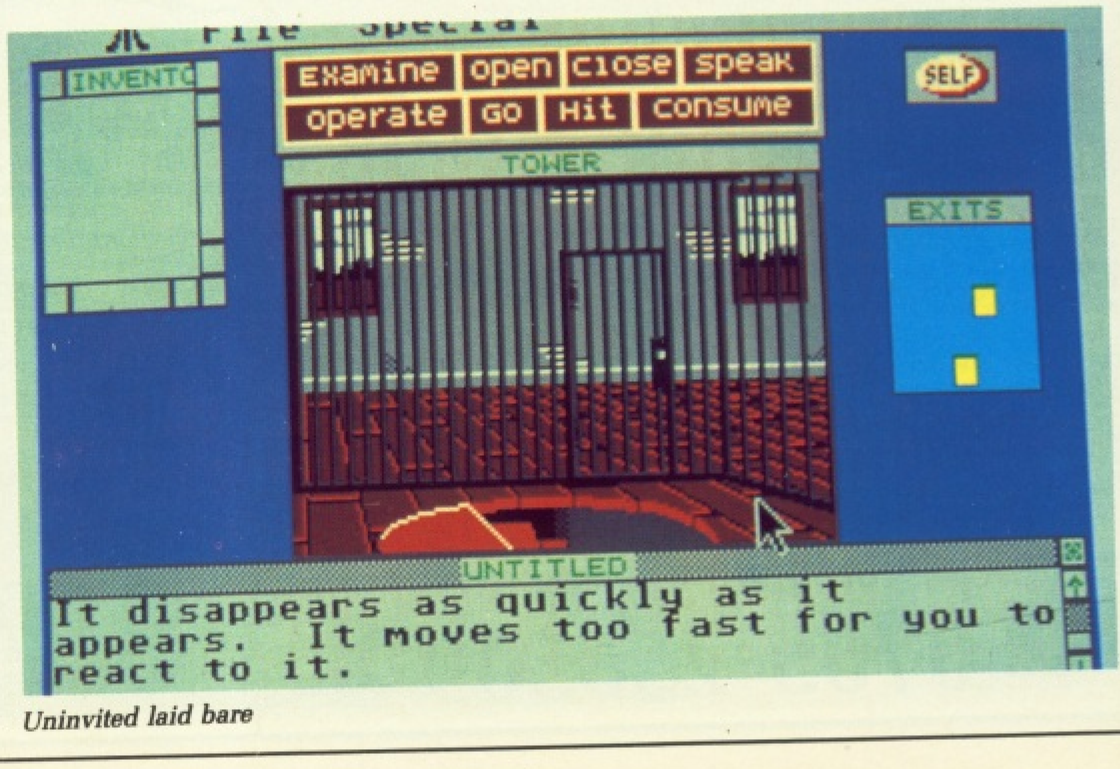
Another way to get your vit up is by killing a lot of enemies to get a higher bravery scorer (brv). When you are next killed you will get more vit if you have more brv. Instead of killing those nasty creatures, you can increase your brv by standing on the turtle and continually pressing fire or clicking the right mouse button.

WHO's afraid of Operation Wolf? Certainly not Janaka Alwis from High Wycombe. No problems on level one. Shoot the animals for extra ammo but watch out for the guys with black berets, they need to be shot twice and throw knives at you if you don't get them straight away.

When two vehicles are near each other fire a rocket bomb in the middle to blow them both up. The red bottles reduce your damage while dynamite blows up any nearby enemies. The free icon gives you infinite ammo and twice the rate of fire for a while.

There are more black berets on level two. Look our for the Rambos who jump and roll across the screen, making them difficult targets. Hit them when they jump in the air. Make sure that you finish with a rocket bomb to spare. To get the boss, aim a little to his right and fire the rocket bomb. He'll blow up but the hostage won't.

You *must* get through level three without a continue. You can only do this twice, and you want to save them both for later. There aren't too many enemies here, so it's quite easy. The only problems are the unarmed soldiers who come on with one arm cocked back. If not killed straight away they lob grenades at you. These



Uninvited laid bare



Infinite lives for Sword of Sodan

are a nightmare to shoot down.

Your damage is reduced substantially at the end of level three, which is quite helpful.

On level four the Arnie lookalikes have body armour so have to be shot in the head. The black berets reappear. The bald blokes fire rockets at you so they're number one on your death list. Your ammo is replenished at the end of this level.

Level five is the hardest stage, even though there are only baldies and black berets. When a hostage appears on the screen drop everything except the mouse and get the guy with the knife who's chasing him. Whatever you do don't shoot the hostages. Your damage will be pretty high – at least it should be if you haven't used a continue yet – so go crazy with your newly-replenished ammo and get as many points as you can before having to restart the level.

The absence of ammo, black berets and baldies on level six make this slightly easier than the previous level, but it's still difficult thanks to the enemy horde who pelt you with hot lead. Unless you have a continue left, forget it. If you do, be careful with your rocket bombs because you must save two for the very end. Again, watch out for hostages legging it across the screen. Make sure they get across safely.

The bonus round appears once during the game. It's not difficult – one rocket bomb will take on three choppers at a time. Aim for the middle one. If you run out of rocket bombs they will fall from the sky.

The final helicopter is a doddle. Keep shooting with the Uzi. If you run out of ammo a magazine will drop from the sky. When the helicopter fires two rockets at you, fire one of your rocket bombs at it. Do this again and you've made it.

If you didn't save any hostages an old man will shout at you. If you get at least one into the plane ... well, see for yourself.

JUSTIN Gavanovic is more than just a long name. He's got a fearful disassembler, and this has helped him produce an infinite lives poke for Sword of Sodan. Type in the routine below and save. When the disc is inserted it won't bring up an error.

```
REM INFINITE LIVES FOR
REM 'SWORD OF SODAN'
REM COPYRIGHT 1989. BY JUSTIN G.
REM FOR AMIGA COMPUTING.
tot=0
FOR n=4587520& TO 4589140& STEP 2
READ a$
a=VAL("&h"+a$)
tot=tot+a
POKEW n,a:POKEW (n+164),0
NEXT n
IF tot=744795& THEN GOTO section2
PRINT "THERE IS AN ERROR IN DATA."
END
section2:
cheat=4587520&
CALL cheat
DATA 615A,337C,0002,001C,42A9,002C
DATA 237C,0000,0400,0024,237C,0006
DATA 0000,0028,4EAE,FE38,33FC,7FFF
DATA 00DF,F09C,41FA,001C,45F9,0007
DATA 2000,23CA,0006,01D4,7064,24D8
DATA 51C8,FFFC,4EF9,0006,000C,303C
DATA 6004,33C0,0004,A4DA,33C0,0004
DATA C15A,4EF9,0003,E400,2C79,0000
DATA 0004,93C9,4EAE,FEDA,45FA,009C
DATA 2480,43FA,0086,4EAE,FE9E,43FA
DATA 002E,4280,4281,41FA,0014,4EAE
DATA FE44,43FA,001E,45FA,006A,234A
DATA 000E,4E75,7472,6163,6B64,6973
DATA 6B2E,6465,7669,6365
```

SPACE: The final front ear has Mr K. Simpson confused. But it's not the game of the Kleenex men, it's Elite. "Just when I'd got completely hacked off with Elite you go and do this to me. Missions? No one told me about missions. Let alone five of them.

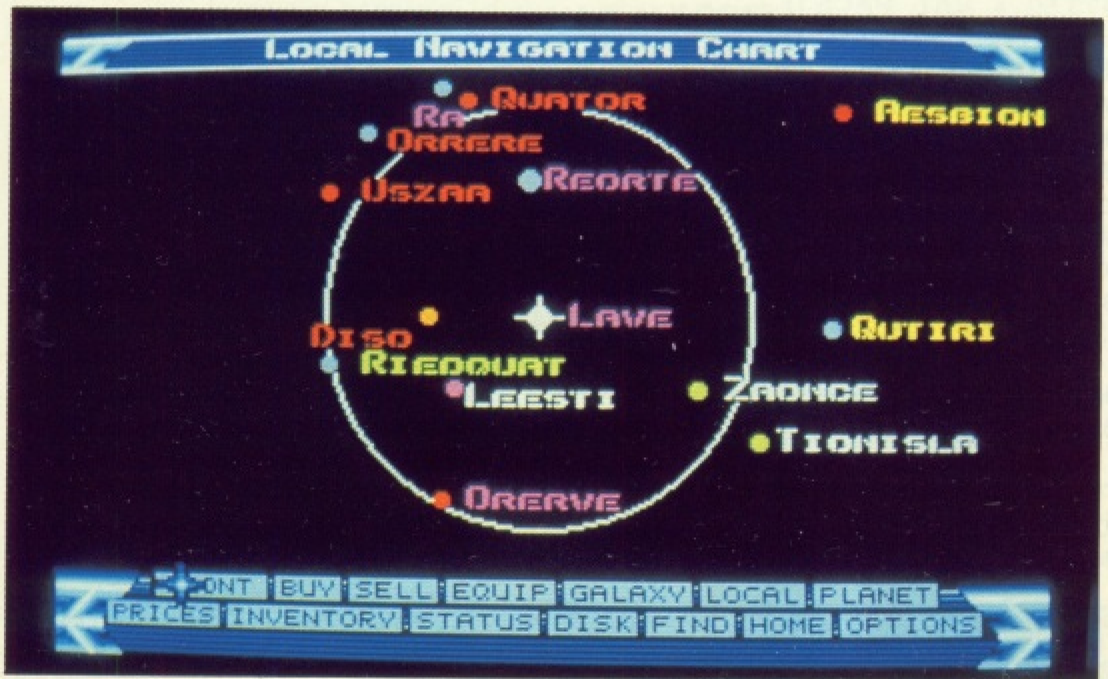
"So all weekend I spend my time trading – having done one galactic hyperspace – and what do I get, nothing. Help.

"My status is competent, as it has been for ages, I have four military lasers and everything else I can find useful. Thargoids are no problem, yet I haven't got a mission to complete.

"Am I in the right place? Do I have to go to a certain planet to get my mission? I've got a feeling I'm doing something wrong. The manual indicates I might have some communications with various beings. If so, how?

"I love the game, but trading does get boring after a while. To know that I am missing something is very frustrating, to say the least. Please help.

"Lastly, one tip that no one seems to have found is that if you plonk a military laser at the rear of your ship it gives you absolutely ages to blast ▶



Elite: Missions start in the second galaxy

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away anything you want while they try to catch up with you. Who needs retro rockets? This may leave you further away from your destined planet at times, but it makes easy work of those pirates".

Well K, missions don't start until you get into the second galaxy. Then you need to hyperspace between 64 planets. So you were nearly there.

SUPER HANG ON has the best cheat mode I've ever seen – a machine gun on the motorbike. To activate the cheat mode you must beat the highest score on the current continent's high score table. Africa is fairly easy. As the name, enter "750J". It should change to "....". The cheat mode is now enabled.

To get into the cheat mode screen, hold down Ctrl, Left Alt, Z and T while the attract mode changes from the credits screen to the options screen. The cheat mode screen will appear when you let go of the T and you will be prompted to enter new coefficients for the road turn effect using the numeric keypad.

Once the cheat mode has been enabled it cannot be disabled, so it is worth remembering that the initial settings are 60 for outer turn and 45 for inner.

The bike gains a machine gun when the cheat mode has been activated. It is used by pressing the left Amiga key. The stream of bullets can be used to destroy other bikes and roadside objects except for checkpoint and goal gates. It is easy to shoot objects you can collide with, so while a Birdland sign is a simple target it is difficult to hit a tree.

There are no special sound effects or explosions because they would be a waste of precious memory and disc space. Have fun.

FINALLY a quicky cheat for Afterburner. Pause the game and type in "together in electric dreams". This is not the same as the ST cheat, and whoever it was who sent in the wrong message deserves to be super-glued to the Atari keyboard. A similar fate will be reserved for anyone found stealing tips from other magazines or sending Max The Hax tips to the enemy.

Super hero creator for Bards Tale

```
FOR i=1 TO 13:READ a,b:FOR j=1 TO a:a$=a$+MKI$(b):NEXT j,i
a$=a$+CHR$(0)
FOR i=1 TO 2
IF i=2 THEN FOR j=1 TO 8:READ a,b:MID$(a$,a,2)=MKI$(b):NEXT
INPUT b$
OPEN "O",1,"BARDS TALE CHARACTER DISK:TPW."+b$+".C"
PRINT#1,a$:CLOSE 1:NEXT i:END
DATA 3,0,10,99,1,-1,2,9999,2,0,1,-32719,7,0
DATA 1,15258,1,-13825,1,15258,1,-13825,2,99,15,0
DATA 5,9,33,9999,35,9999,37,0,65,7,67,7,69,7,71,7
```

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Don't miss these back issues

November 1988 issue

Comicsetter make DTP fun for all while AmigaTex does a better job than anything the PC has ever seen. ARexx and WShell: Two programs from the world of the mini and mainframe which make the most of the Amiga's multi-tasking environment. Plus a selection of truly authoritative game reviews.

December 1988 issue

How the Amiga came to be. Discover the pitfalls of learning C. No-punches-pulled reviews of Microfiche Filer – a new way to look at databases; Cygnus Ed – the best screen editor available; Digicalc – a cut-down spreadsheet at a budget price and the latest 3D graphics tools. A host of games reviews. Full techie tips on IFF. Interviews with the top games makers: The Bitmap Bros and Origin.

January 1989 issue

Beebulator: World exclusive review. Protext preview. What has 24 pins and looks good on paper? It's the Citizen HQP-40 colour printer! Home accounts – tales from the valleys? No, a package to balance the books. Midi Magic sounds great, the Supra hard drive is great but costs.

February 1989 issue

Shoot-em-up construction kit. New series on Basic and machine code. Digita's Mailshot takes the pain out of postage. Datel sampler sounds off, but a magic box will make the Amiga sound much better. E-type – the typewriter emulator – filed under WPB. A cheap but great modem from Amstrad. K-Gadget – programmers' friend or fiend? Best Amiga toy yet – the Microtext teletext adaptor.

March 1989

Hisoft Basic Compiler undergoes a speed trial. Deluxe Print shows its colours. A listing in C to scan a disc for IFF pictures. Dragon's Lair review and play tips. Programming functions in Basic. What went on at the Developers' Conference in Germany. Max the Hacks shows how to win at Rocket Ranger, Roger Rabbit, Out Run and Elite. Jez San puts the official Commodore speed-up board through its paces.

April 1989 issue

Big Screen Hero – we can't take our eyes off the monitor with a 1008 x 1008 resolution. Triangle TV, the company which married the Amiga to commercial video, tells its tale. Gen up on genlocks – we look at the four main contenders. Superplan, the businessman's ménage-à-trois flexes its muscles. Zoetrope, animation at a price. Amigas by accident – we meet the Burocare think-tank.

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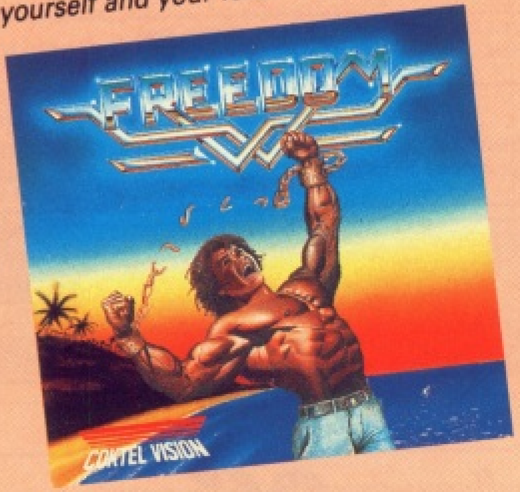
Freedom

A fascinating game of strategy and role-play combined with gripping combat.

In the 18th century in a tropical plantation of a sugar producing colony, as the leader of a slaves' revolt, you are attempting a heroic escape towards freedom.

In the game you can select the level of difficulty, choose your character's personality, rally round other slaves, set fire to buildings and fields, challenge your enemies with the cutlas and confront the fearsome hounds set at your heels.

But will you succeed in your efforts to liberate yourself and your fellow slaves to freedom?



Hell Bent

In 3530 Stellarfleet Captain Drak Hellbent achieved annihilation of Kraellian usurpers throughout Aldonicha.

Relive legendary action with this computer representation of the tortuous terrain that was encountered by Hellbent.

Confused? you'll be knocked out by the speed of scrolling and the sheer skill required to master this mega-fast scrolling shoot 'em up.

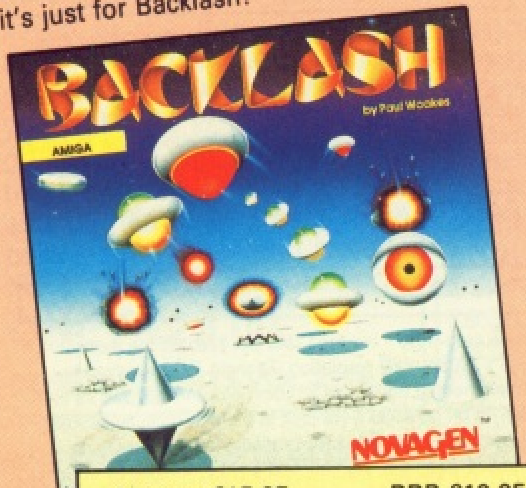


Backlash

This really is a game that any arcade fan should have in their collection!

It's a fast action, full screen, solid 3D graphics fast-action game. Bursting with stunning realism, Backlash shows the 16 bit processor stretched to it's limits.

For sheer playability and addictiveness, you should take us up on this special offer – even if it's just for Backlash!



20,000 Leagues under the Sea

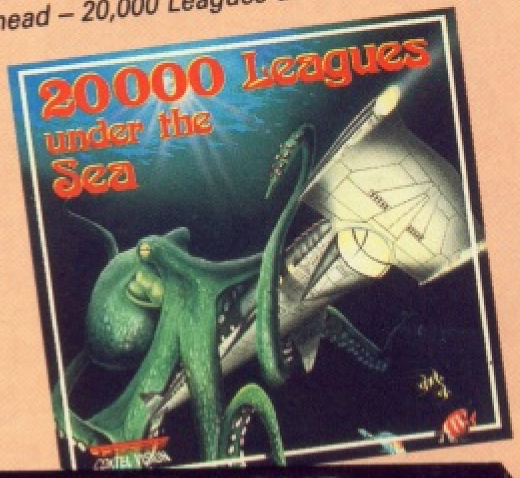
Excerpt from the Coktel Post, 5th July 1867:

"Monster of the deep strikes again!

"The government has fixed the departure date for the famous vessel the 'Abraham Lincoln', helmed by Mr. Farragut who is going off in search of the deep sea monster.

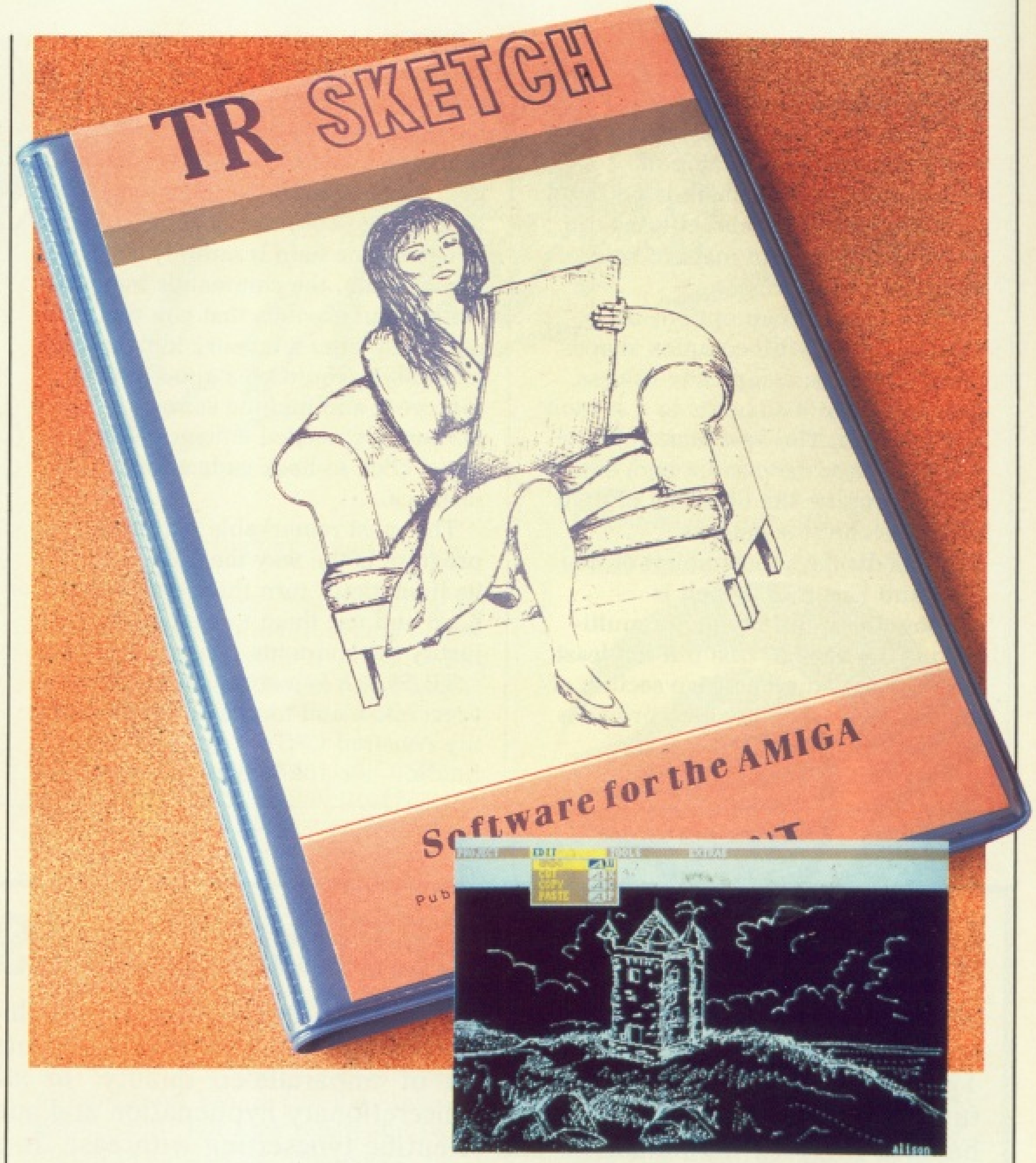
"The great French professor, Mr. Arommax, will also take part in the expedition."

So begins this amazing computer adaptation of Jules Verne's classic novel. Can you succeed where others have failed, and survive what lies ahead – 20,000 Leagues under the Sea?



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Back to the drawing board

A real horror emerges from the Australian outback. Alastair Scott charts his chastening experiences with this aboriginal artefact

CAN you visualise an art program which takes up less than 50k, is intended to be jumped in and out of via the CLI while you do a bit of word processing, has cut-and-paste functions which need one meg to function, which has only the most basic facilities, all for £30? Once upon a time, neither could I.

For your cash you get a disc and a crude photocopied manual with plentiful dot matrix text. The manual explains how the program works clearly enough. Eventually. I mean, it's page 21 before you are told how to load the program, the previous 20 pages being filled with vast quantities of repetition of the Amiga manuals, supposed justification for writing the program – of which more later – and hot air.

On booting up TR Sketch from the Workbench you are shown a window telling you that the program is alive and well, then a blank screen. Calling up the menu bar displays four options.

The first, the Project menu, contains the usual file handling options. IFF format – for storing screen pictures – is used exclusively, but pictures must be 640 x 200 resolution with eight colours.

More colours? Different resolution? Sorry, not possible. Some demonstration pictures on the disc are silent testimony to the program's limitations. One called The Old Castle is particularly noteworthy – it could easily be mistaken for a Spectrum screen picture. The lack of colour and generous use of blank spaces proves that a picture *does* tell more than a thousand words.

The Tools menu supplies paintbrush, airbrush and freehand drawing. There is only one thickness or paint density of brush, spray and pen. Ellipses, rectangles and lines can be drawn using rubberbanding, and there is a crude erase option.

Text can be incorporated into your artwork, but you are restricted to the smallest size of the standard font.

I had problems on a 512k machine with the paintbrush; using it tended to make the screen flash, and a crash could only be prevented by frantically clicking the mouse buttons for a few seconds until the menu bar reappeared.

There is an Undo option in the Edit menu. Draw four lines, press Amiga-U and only the last line will be removed. Better than nothing, I suppose.

Cut and Paste, as mentioned above, only work with more than 512k. The cut part of the screen is unceremoniously dropped on top of the background. There are no options which allow you to AND, OR or XOR it with what is already there. Nor is

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there is a Magnify option.

In the Extras menu there is, as the name suggests, a collection of leftovers. Incredibly, there is no flood fill. Only rectangles and ellipses can be filled with a solid mass of colour; there are no patterns.

The Join and Snap options do obscure things with complex shapes. Invert, which is completely useless, does just what it suggests to a section of the screen. The Fast Menu allows you to change the current pen, and Palette supplies the usual set of RGB sliders to alter the colours.

Status displays the amount of free Chip and Fast ram, which is supposedly useful if you are multi-tasking TR Sketch. Last but not least is the most comprehensive section of the program – Help, which provides adequate instructions for every command.

TR Sketch was written in C. Given that compiled programs are on the whole enormously wasteful of memory, the program is tiny and its limitations are painfully obvious. Every command is pared down to the bare bones – beyond in some cases.

The online help is entirely unnecessary, the commands being so simple and obvious that you don't need help after a cursory look at the manual. It would be a good idea to remove it and include some desperately needed enhancements, like a click-to-back gadget for instance.

The most remarkable part of the program is the way the authors note its limitations, turn them on their head and use them to supposedly justify the shortcuts.

TR Sketch is a complete waste of time, effort and money. I'd rather use my Amstrad CPC's Advanced Art Studio – it's 18k longer and 180 times better. Given the graphics capabilities of the two computers, this shows just how inadequate TR Sketch is.

REPORT CARD

TR Sketch
HB Marketing 0895 444433
£29.95

EASE OF USE..........
So simple and obvious that you only need a cursory read of the manual. Then again, it doesn't do anything powerful enough to need explaining.

SPEED......................
The Fill, the only processor hungry option, takes far too long to do what it does.

VALUE ....
A complete waste of time, effort and money. Save up for DP Paint

OVERALL *19%*

Its limitations are painfully obvious.

AMIGA Letters

Why must we suffer?

I FELT totally disgusted after reading the "Piracy is not a crime" letter in your March issue. How on earth can the writer justify what he is doing? I notice that he concludes his letter with an audacious statement, yet dare not have his name published.

If you can't afford something, you have two choices – save up for it or go without. If the anonymous writer opts for the second choice, then the product can't be that important to him. At present he is as low as a thief.

I buy one piece of software a month. I read various reviews and then buy what is in my view the game of the month. In this way I build up a small but elite collection of *original* software. Why can't the pirate reader do the same? Probably because he is very greedy. He must have no conscience at all.

Why must the rest of us suffer for what he and other software thieves are doing? He must have known when he bought his Amiga – presumably he did *buy* it – that games would cost £20+.

Craig Thornton,
Nettleham, Lincoln.

Speed is of the essence

I AM an A level student studying Further Maths and Physics – don't be fooled, I'm a nice guy really – and as such come across some groovy little alterations like Mandlebrot sets, Julia sets and a few hip mechanic and dynamic formulae.

However, just because I know what the previous sentence meant *(Glad someone does. Ed)* it does not imply I can program in any language other than Basic, which is almost embarrassing.

I love using Basic, but some pictorial results take upwards of four hours to calculate, which ties up the machine and I can't play Bard's Tale until it's finished. Think of that – four hours without playing a game. How do I survive?

My inquiries are about speeding up this Basic calculating. It seems I have four choices: Upgrade to a 68010; buy another version of Basic; buy a maths co-processor; steal a transputer from Inmos.

So my questions are: 1) If I can't run the 68010 and 68000 program before loading a piece of software, how much software will cease to work properly? 2) Which Basic is designed for the types like me. if any? 3) How much are co-processors and how much software uses them? 4) What is the security at Inmos like and would an Amiga 500 talk Ocean?

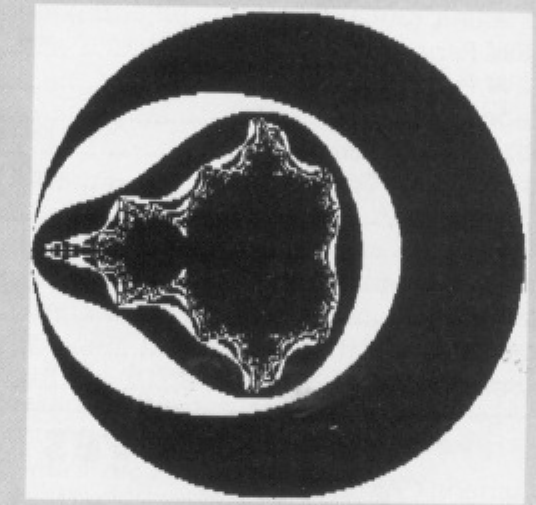
Finally – was that a sigh of relief I heard? – is Workbench 1.3 software or hardware? Where can I lay my hands on it? For how much and what would happen to my warranty?

Mark Cann,
Crawley.

What very interesting questions. Wish we knew the answers. Only joking, but we are going to pull out of two of them because we have articles on some accelerator boards coming up very soon, one of which costs just under £300 and features a 68020 chip with a maths co-processor. Watch out for the reviews, they should make interesting reading.

What you need, Mark, is the HiSoft Basic Compiler. To test it out we wrote a hasty but functional Mandlebrot Set program to do this which took 62 mins 22 secs in AmigaBasic and only 5 mins 2 secs in HiSoft Basic. The same program, no changes, hand on heart.

HiSoft Basic costs £79.95 if you buy it now. If you wait until the 1,000th copy has been sold – and Dave Link of HiSoft (0525 718181) tells me it's selling well – you will have to pay another £20. Snap it up, we reckon it's a bargain.



The Mandlebrot Set

Workbench 1.3 is also well worth the money. It's a manual, three discs, no hardware and costs £14.95. Try the UK Amiga User Group (0533 550993).

Write to: The Editor, Amiga Computing, 78-84 Ongar Road, Brentwood, Essex, CM15 9BG. We'll send the writer of the best letter each month a program from our goodie drawer.

What the doctor ordered

RECENTLY I bought an Amiga, 512k memory expansion and a Cumana disc drive. Being a newcomer to computers I had to do a good deal of reading beforehand. After going through various magazines I decided to go for the Amiga because its applications suited most of my needs.

I have been reading *Amiga Computing* since last November and have now become a subscriber. The magazine has proved to be the most useful "software" that I will be needing to learn my machine.

Now my problem: I am having

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increasing difficulty in formatting discs. These are unbranded but certified discs I bought in bulk through an advertiser in our magazine. I am having no difficulty in making backup copies on these discs and the programs on them run without any problem.

However, on formatting them the system informs *Error Validating Disk* or *Disk is unreadable* with an advice to consult DiskDoctor – which, after a painfully slow process, informs me of a hard error on all tracks and that the disc structure is corrupt.

I have used both Workbench and AmigaDos to format them but the result is the same. Yet when I make backup copies on the discs they work well. To make the problem more confusing, at other times the computer formats the discs without any problem.

What is this temperamental behaviour due to? Is there any fault in the discs? When in this mood the computer treats branded discs in the same way. Or is there a problem with the disc drive? It makes no odds if I use df0: or df1:. Is there something else I should know about?

I would also appreciate if in some coming issue you would publish an article about computer viruses and how to save software from being infected.

Navid S. Qureshi, Stirling.

Last question first. Protecting yourself from viruses is easy. Get yourself a copy of VirusX. It's a public domain program that you should ideally run from your boot disc Startup-Sequence.

It remains in the background checking every disc you put in the drive before validating it. Check out 17 Bit (0924 366982) or AUG (0533 550993) for more details of PD software.

A hard error on all tracks sounds fairly terminal. Are you sure the discs that have given you this message have been reliably usable after reformatting?

The fact that you're having trouble with both df0: and df1: suggests that your problem is caused by the discs, not the drives. Because 3.5in discs have hard cases, newcomers to computing are sometimes led into a false sense of security. Had you upgraded from a 5.25in set-up you would know just how important it is to take good care of them.

There are two main problem areas.

AMIGA Letters

The first – magnetic fields radiated by electrical equipment, typically monitors and TV sets – can erase the magnetically stored information on the disc, disrupting the format at the same time.

It's an awful temptation to stack your discs on the flat top of a TV or monitor – I've even seen stacks of discs on a power supply unit. Nine times out of 10 you'll escape scot-free; it's the 10th time that drains the blood from your face.

The second problem area is less obvious – dust and smoke. The read/write head in a disc drive never comes into contact with the floppy disc surface, it floats a very tiny distance above.

If you're a heavy cigarette puffer or a bachelor who doesn't know what a duster looks like, smoke and dust particles can drift into the drive when you insert a disc. Said particles can then get between the read/write head and the disc surface, causing the minute scratches which make the disc unreadable.

Generally you can recover a lot of the information on a corrupted disc using DiskDoctor. Once the doc's done his work you copy everything on to a disc which you know is OK and reformat the dodgy one, which usually steamrolls over the hard errors. If it doesn't, get the flame thrower out and turn it into a Blue Peter ashtray.

You must remember to use the Copy command to transfer salvaged files, not Diskcopy. The latter will transfer everything, including the sectors of the disc that have read/write (hard) errors on them.

Another feature of Diskcopy is that it formats as it goes, which is why your corrupted discs work OK when you Diskcopy other discs on to them. If the source disc is pucka, so will the copy be.

Anyway, the morals of this story are: Always keep at least two backups on separate discs of any important files; always store your discs in a disc box away from electrical equipment in a dust-free environment – no, on the window sill in the sun next to the pot plant is not a good place – and always use branded, double-sided discs to store information that you don't want to lose.

Driving me mad!

THE printer I am using with my Amiga is a Tandy DMP130, which is IBM compatible, and I am having a problem finding the correct printer driver for it. For graphics programs I have to use a driver for the Panasonic 1801 and for word processor type programs I have to use the CBM-MPS1000 one. I can't use the CBM driver for graphics and I can't use the Panasonic driver for text.

Do you know of any driver that will do the same as both of the others? If not, do any of your readers have the same set-up as me?

Also, could you tell me where I can get some educational software for my daughter, aged four-and-a-half? She is quite happy using the mouse and is able to load and use Photon Paint quite easily.

V. Langley, BFPO.

We don't know the Tandy DMP130. Workbench 1.3 comes with more printer drivers. We've checked, and yours isn't among them, but you may find one that works better, especially as there is a very detailed section on all the drivers in the Workbench 1.3 manual. Having said that, somebody somewhere must have a printer driver tailor made for you.

The Protext word processor comes with more than 20 drivers, including a plain IBM one which sounds like it might work. The trouble is, it's going to cost you £79.95 to find out. Unless you know somebody local who owns Protext? At a computer club maybe?

Clik (0753 682988) sells a bit of educational software for the Amiga, so does SCC (091-565 5756). Has your daughter discovered Clock yet? The young son of a friend is also four-and-a-bit and his favourite trick is booting Workbench, clicking all the correct icons to run the Clock program and then spending a happy hour or two moving it about the screen. He can't tell the time yet, but boy can he drag a window.

One for the book

IS there is anything available for assembly language programming on the Amiga for absolute beginners? I may have gone about things the wrong way. I have bought the DevPac assembler along with Amiga Machine Language by Abacus and 68000 ALP by Osbourne McGraw-Hill.

All this valuable and very useful

►

◄

information is currently going to waste because I haven't the basic building blocks of knowledge needed to begin the write assembly language.

Peter Cainey,
Exeter.

You need a good assembler, Peter, and DevPac is a very good assembler, but there's no point in owning a powerful tool if you don't know how to use it. Get yourself down to your local library and dig out some books on how computers work. They don't have to be Amiga-specific, just any old book that tells you how data is moved around the wires inside.

A good book for newcomers to the 68000 – that's the chip you program inside your Amiga – is a Glentop one in the First Steps series. It costs £9.95 and is called 68000 Assembly Language (ISBN 1-85181-081-1). It's not Amiga specific, but it will give you the basic building blocks you're looking for. Once you've worked your way through that one, the Abacus book will make a lot more sense.

The Computer Store (021-770 0468) should be able to get it for you if your local library can't.

Dutch courage

I NOW and then read your magazine because my friend buys it for his Amiga *(A computer that can read? Go on, pull the other one. Who do you think I am, an ST owner? Ed).*

The main reason I am writing is that I am an ST owner *(Oops. Ed)* and I am sick and tired of the "my machine is better than your machine" war. As most 16 bit owners have a 16+ age they should stop fighting like children. But your magazine isn't making things easier.

In the most recent issue I saw, issue 9, I read several pieces saying – not directly, mind you – what a super machine the Amiga is and what a boo-machine the ST is. When are you going to grow up?

Both machines have advantages and disadvantages. Instead of showing the good points of both 68000 machines – an all-round machine for games and serious stuff, something which can't be said about IBM clones – people are always trying to kill each other.

Jay Lee,
Capelle a/d yesel, Netherlands.

We think "always trying to kill each other" is a bit strong. We haven't killed an ST owner for at least six months. Gets a bit boring after a while.

A friend took his Amiga to a local computer club the other evening. As he walked into the hall a group of ST owners sitting in a corner by the door copying discs poo-pooed him and loudly pointed out to the rest of the membership how inadequate a machine my friend's computer was.

After a short while he plugged his Amiga into a couple of self-powered 20 watt speakers and booted Out Run. Guess which machine all the members – including the ST owners – were standing around 30 seconds later? We'll give you a clue: It wasn't the ST.

Come on, Jay, this is an Amiga magazine. What do you expect us to say? The people who write this magazine live and breathe Amiga. It's what makes Amiga Computing *the best Amiga magazine around.*

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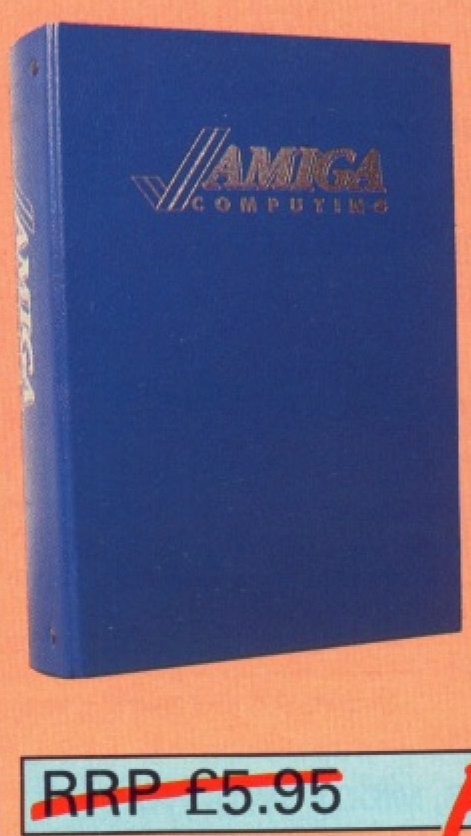


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